8·16

The Bournemouth and Poole Atari User Group's Newsletter

80p | August 1988 | Issue 4

ATARI

BAPAUG

The 8-bit Mouse
Star Chart - The Rebel Universe
Turbo Basic de-Tokeniser

+

Software reviews and the Latest News

The Crew

Colin Hunt .....Captain
Thomas Holzer .....VCS Controller
Neil Longman .....Dragon Keeper

How to contact us

Letters and articles should be sent to

8-16
c/o 248 Wimborne Road
Oakdale, Poole, Dorset BH15 3EF

All articles published within 8.16 are the copyright of the author, but can be used by other publications provided the author and 8-16 are acknowledged as the original source and a copy of the publication is sent to 8.16.

This issue of 8.16 was produced using the following hardware / software combinations

Atari 8-bit: Ataiwriter
Mini Office II
Atari ST: STWriter
1st Word
Apple Macintosh:
Microsoft Word
MacPaint
MacDraw
Aldus Pagemaker V2.0

Articles were transferred between the different machines using the following software.

Tari-Talk Atari 8-bit to ST
GEM-Kermit & MacKermit
Atari ST to Macintosh

The opinions expressed within 8.16 are those of the authors and not necessarily held by the BaPAUG.

The BaPAUG is a non profit making organisation and no members make money from club activities.

Contents

Programs

The 8-bit Mouse 12
The first article describing how to use the Atari ST Mouse with the Atari 8-bit range of computers. Within this issue of 8.16 we present the basic loader routine along with details on how to use the object code from within your own programs

Turbo Basic de-Tokeniser 20
Un-scramble those lost basic programs

Special Features

Atari Show Reports 22
BaPAUG member's views on the first Atari Show to be held at the Alexandra Palace

Star Chart - The Rebel Universe 4
The completest Star Chart yet to be published for the Firebird game Star Trek - The Rebel Universe

The Atari ST and Robots 24
Brief details about two robots that can be connected to your Atari ST

The Price To Advertise - A Survey 18
A survey of computer magazine advertisement costs.

Reviews

Ords 25

Tari-Talk 14

VCS Game Review's 11
California Games & Jr. Pac-Man.

Regular Features

BaPAUG News 13
Upto date news for BaPAUG members

Dungeon and Dragons 24
We've managed to drag our Dragon Keeper away from his duties in order to write a column on D&D. To start an introduction to what its all about.

Info 19
The Programs / Subscriptions / Subscription Offer / Commercial Advertisement.

Inside Turbo Basic 15
Details on the values required to produce music with the DSOUND command with some background information on how sounds are produced using the Atari 8-bit POKEY chip

Notice Board 3
All the latest news pinned up for you to read.

Product Update 25
News on the latest add-on devices, books and accessories

Show Dates 22
Dates for future computer shows

Software Roundup 10
News on the latest software releases.

User Group File 26
Want to join a user group? Yes, then look here for your local group.

Notice Board

Staff Required

Zeppelin Games are currently looking for programmers, musicians and graphic artists to add to its list of freelance staff, to place conversion and original work for the Atari ST and 8-bit range of computers.

If you feel you fit these criteria and would like to produce for **Zeppelin** then contact Brian H. Jobling, Software Director, on (091) 281 4401. Better still send an example of your work to him at 28 Osborne Road, Jesmond, Newcastle Upon Tyne, NE2 2AJ.

Business System for Atari 8-bit

ComputerHouse UK have just released **Turbobase** a fully integrated business system for the Atari 8 bit range of computers, for £119.95.

Features include relational databases, word-processor, spreadsheet, graphics facilities, accounts system, stock control, payroll system and file management. Turbobase also supports all the hardware modifications including the 6 Times 8 cartridge, MIO board, harddisks and US Doubler.

ComputerHouse can be contacted on 01-731 1276.

ST Portable

See it at the Personnel Computer Show,

If you go to the Personnel Computer Show being held at Earls Court from the 14th at 18th of September check out the Atari stand, as you are very likely to have your first glimpses of the ST Protable computer.

Atari UK have just confirmed that they are developing the portable as well as the Abaq which hopefully will be at the show also. Also look out for the CD Rom unit and 1040STs fitted with blitter chips.

or at the Atari User Christmas Show?

If you can't make the PC Show, then don't despair as Atari are taking a large stand at the Atari User Christmas Show being held at the Alexandra Palace between the 25th and 27th of November where once again it is hoped that both machines will be on display.

If you are going to the Atari User Show feel free a photocopy the back page and use the Advance Ticket order form to obtain a £1 discount on your tickets. The order form has been marked with the initials AAUG so please use this form in preference to those available within the glossy magazines.

Art Director & Atari break into textile design.

Martin Brown, a young freelance designer working from a studio in London's Docklands, has taken the Atari ST personnel computer into the world of textile design.

Using an Atari 520ST colour system and **Mirrorsoft's Art Director**, Martin has spent the last 6 months working up a portfolio of original fabric and wallpaper designs which have been favourably received by industry giants like **Dorma** – even though many of these companies have computerised design systems costing many times more than an Atari ST.

To coincide with this new venture, Mirrorsoft are, from September 1st 1988, offering **Art Director** and its sister program **Film Director**, as a combined package priced at just **£49.99**. Until now, the two packages, purchased separately, would have cost £109.98.

Art Director is a sophisticated design program offering a wide range of facilities, including the ability to duplicate patterns of any size and use these patterns as paintbrushes and to select the subtle gradations of colour required by the discerning designer.

Film Director can take in designs created with Art Director (and other ST graphics programs) and edit elements of them together to produce animated sequences. These sequences can be transferred to videotape with the use of a simple modulator, providing an ideal medium for presentation.

Mirrorsoft can be contacted on 01-377 4837 and Martin Brown can be contacted on 01-481 0734.

New Computer Store

A new computer store has recently opened within the Bournemouth & Poole area. The new store **Columbia Computers**, is situated at 17 Columbia Road, Ensbury Park, Bournemouth. **Derek Pearse** the proprietor, can also be contacted by telephone on 0202 535542.

The store is open from 10am to 6pm on Monday to Wednesday & Saturday and from 11am to 8pm on Thursday and Friday.

Software for all the mayor computers is stocked, including the Atari ST. Software for the VCS and 8-bit machines can be ordered.

Star Chart - The Rebel Universe

Still stuck within the Quarantine Zone?
Yes, then the following Star Chart may help you complete your five year mission.

For those of you lost or confused the following Star Chart is for the *Firebird* game *Star Trek - The Rebel Universe*. The United Federation of Planets have set-up a Klem Sphere, with a 100 light year diameter, centered upon the star Dakaik within the Sagittarius Arm. This region referred to as the Quarantine Zone, has been effected by a Klingon invention which is used to switch the allegience of Federation starships to that of the Klingon Empire.

The game has several possible winning scenerios which include converting Federation commanders back to the Federation, destroying the Psi matter (the Klingon invention), building a second psi-matter to counteract the first, or trying to blackmail the Klingon Admiral. The following star chart, though still uncompleted, will help with all these scenerios.

One way you cannot win is by destroying all the Klingon starships. Firstly there are too many and secondly you can't go looking for them (they come looking for you) Just for interest the approximate number of starships within the Quarantine Zone is as follows:-

290	Rebel Federation
610	Romulan
1030	Klingon

In order to play the game successfully you must master the star globe. This is were you decide which stars to visit and involve passing through three layers called the Quarantine Zone the Reginal Zone and the Local Zone. Each zone is a sphere starting at 100 light years across for the Quarantine Zone, 50 light years for the Reginal Zone and finally 25 for the Local Zone. On the star chart the zone a star is found within is marked by the letters Q R and L after the stars co-ordinates. Once you have mastered the star globe the rest of the game becomes easier

The star chart is split into two sections, the first details the mapped systems and any system where some information is known the second details the un-mapped systems. The structure for each entry within the mapped systems the is as follows

1.Star name
2.Co-ordinate / zone
3.Alliance / No. of planets
4.Planet types
5.Items found on life supporting planet.

The entry for the un mapped systems follows the same format except that only the first three entries are present.

Some inside information The co-ordinates for each of the star systems, as well as giving the X, Y and Z co-ordinates also provide the name of the system For example, the co-ordinate 60 27 52 would give the system the name Darlom This is produced by turning the co-ordinate around (eg our example becomes 52.27.60) and using each number as a code to the letters making up the systems name In our example 52 gives us D 27 gives us ER and 60 gives us IOM. All the systems listed follow this rule. There is most probably more information hidden into the co-ordinate than just the name, but I have not yet found them. One side effect of this technique is that all the systems have un-destinquished names and are therefore difficult to remember

The key to the planet types can be found on page 9 while the key to the items found on Life Supporting planets is on this page.

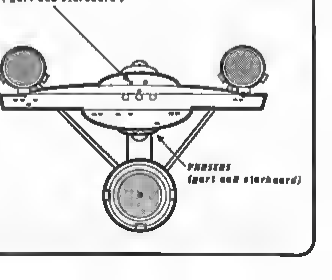
Colin Hunt

Key To Items Found On Life Supporting Planets

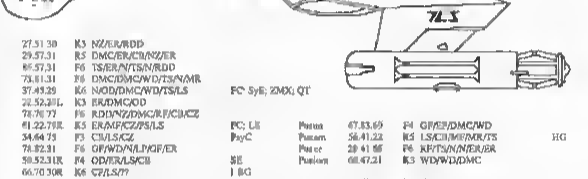
BF	*Blackmail File*	
CC	*Carrokov Crystals*	Warp engine drum restored when on board.
CE	*Cyclon Emitter*	Use against security bomb.
CmE	*Chaff Emitter*	Battle damage less likely when on board.
DC	*Databank Console*	Use ZMX Device
DD6	*Dilithium Delta 6 Crystals*	Use against research punisher console.
FC	*Flora Canister*	Use against deer
GOF	*Guardian Of Knowledge*	
HD	*Hotshot Device*	
HG	*Helex Gun*	Use against Janitor Robot or deer.
I-BO	*I Beam Generator*	Use Lepton Gun.
KA	*Klingon Admiral*	
KCF	*Klingon Code File*	Use against Klingon signal console.
KJD	*Klingon Jamming Device*	
LE	*Logic Emitter*	Approaching rebel ships turn loyal when on board.
LG	*Lepton Gun*	Use against I Beam Generator
P WD	*Psi-Wave Device*	Klingon Psimitter detection enabled when on board.
PB	*Pounce Bomb*	
PsyC	*Psychogen Canister*	Use against Rebel Commander
PVA	*Pounce Virus Ampoule*	
QC	*Quantum Crystal*	Use against Security Bomb.
QT	*Quantum Trigger*	Use against Library Robot.
RC	*Rebel Commander*	
RCF	*Romulan Code File*	Use against Romulan Signal Console.
RJD	*Romulan Jamming Device*	
SB	*Synapse Bomb*	Nearby Klingons neutralised when exploded.
SC	*Signal Console*	
SCD	*Solar Scan Device*	Solar system scans enabled when on board.
SE	*Sonic Emitter*	Use against Klingon Imperial Guard or Romulan Centurion.
SyE	*Synchron Emitter*	Use against Janitor Robot.
TG	*Tachyon Gun*	Use against Blast Door.
ZC	*Zarium Crystals*	Crew healing time reduced when on board.
ZMX	*ZMX Device*	Use against Databank Console.

The Mapped Systems

Heklaw	15.51.5S	J3	L/M/J/N	
Helwe	78.21.55L	F5	WD/DMC/ER/NMF	
Hermel	73.57 34	F6	L2/MR/OD/EUER/N	
Hermo	83.31.93	F6	CZ/GF/ER/IRD/DMC/CB	
Hikon	34.52.55R	K3		PsyC
Hirtulu	54.59 92	F6	MR/CH/AC/LS/OD/ER	HG
Hrun	62.76.55	K4		KCF
Hutou	64.82.54	F6	AC/N/RC/NER/RNZ	
Hirtul	25.82.53R	R5	N/RDD/RH/AC/LS	PsyC
Hlaak	58.88.53	K4	NC/BG/FN	
Holkm	68.52.07	F4	NZ/IUC/FN	
Holcd	24.52.10	K3	ER/NR/NZ	
Hoflju	37.70.55R	K5	CP/LS/IT	I-BG
Hoster	27.28.55L	K4	DMC/CB/UF/CB	
Houzan	39.40.55	K4	DMC/CB/UF/TS	
Houlou	66.94.55	K6	TS/WD/ER/CZ/CP/DMC	
Curwun	19.60.60R	R4	TS/LS/WD/DMC	RCF
Curtul	20.42.59	F5	CP/LS/DMC/ER/NZ	QT
Curkeh	57.55 12R	K5	OD/IRG/FER/LS	SB
Curlur	48.73.60L	04	NCB/CB/MR	
Curlun	19.25.61R	K3	RDD/PC/LS	TG
Curnun	64.67 14Q	K5	OD/ERG/FER/LS	I-BG
Curvec	40.51.15L	F5	MP/NZ/OD/DMC/TS	
Curulu	67 85.59R	P3	LS/ER/DMC	
Curxaun	57 43.13	06	WD/DMC/WD/NN/ER	
Curzun	59.49 11	K4	WD/ER/TS/RDD	
Cuskal	25.55 13L	R6	N/ER/AC/NGF/DMC	
Cuslur	88 51.61	K5	L2/DMC/PC/LS/MR	
Cusrul	21.37.6C	F5	WD/DMC/NF	
Cutrun	64.91.59	F5	NZ/RDD/SD/WD/N	
Cuvrun	40.43.61	K5	BM/DMC/PC/MG/GF	
Cuzun	19 71.61L	I4		KJD
Dalkuk	51.50.59Q	F5	WB/DMC/LS	RC
Dallun	42.20.51	P5	NZ/ER/OD/RR/AC	
Dantun	10.62.51R	P3	WD/DMC/LS	PsyC
Dekul	22.51.52	K4	CH/AC/LP/N	
Delnk	53.69.59L	F5	PS/MR/OD/ER/N	
Dunwu	68.57.51	P3	PS/MR/OD/ER/N	
Dekuh	51.83.52L	K3	RDD/PC/CP	
Dexun	48.37.52	K4	MR/CB/MR/CB	
Dezun	49.93.50	K6	DMC/MF/CZ/NZ/WB/WD	
Dunul	73.82.51	F5	CZ/GF/DMC/ER/CZ	
Dkuk	50.50.08	F8	MR/CH/DMC/CB/AC/N	
Doryn	34.20.52	K3	MR/RF/TS	
Dozyz	37.34.50	F5	OD/ER/DMC/DMC/ER	
Duzun	39 46.50R	K6		PsyC
Gabun	18.20.64	K5	NZ/ER/MR/NZ/WD	
Gakul	25.48 16L	K6	NGF/N/CZ/N/DMC	
Galux	49 68.63L	K6	ER/IRG/ZN/WD/ER	
Gamuk	51.56.16	F5	NZ/EU/PCN2/RDD	
Garwun	66.62.64R	K4	LS/WB/MR/TS	I-BG
Garzun	63 74 64L	K3	DMC/PC/NZ	
Gaxcun	42.32 64	15	CZ/PS/LP/LS/GF	ZMX QOF
Gazun	67.86.62	F5	BR/LP/GF/ER/N	
Gazur	26.38 63	P3	DMC/ER/MF	
Gazwun	53.38 16	K4	CB/AC/LP/N	
Gazjuk	51 86.64	K3	DMC/MF/CZ	
Galdun	63.51 16	P3	RDD/CZ/NZ	
Gelur	77.69.64	15	PS/LP/MR/PS/MR	
Gelur	57.69 64	P6	DMC/OD/LR/NMR/MF	
Gemun	65 57 14	K3	DMC/RF/SD/WD/LS	HO
Gemul	25 57 15L	K6	N/DMC/RDD/NZ/CB/NZ	
Genur	26.27 64	K3	DMC/NZ/ER	
Genlun	61.33 19R	K6		PsyC
Genuk	53.81.64R	R5	RF/AC/MR/LS/RDD	DD6
Gekux	58.39 64	K3	DMC/NZ/ER	
Gexlun	18.45.22	P5	RF/CB/PC/RF/WD	
Gezun	59 93.64	K5	RF/LS/MR/SD/WD	CC
Gimlur	30.58.14L	K6	ER/WD/N/ER/WD/CB	
Ginun	14.64.62	F4	MR/NZ/TS/DMC	
Giuzu	63.28.64L	K4	ER/CZ/MR/NZ	
Gizlul	22.28.64L	I3	PC/CP/LS	GOF
Glalun	42.82.64	K6	PC/CB/DMC/AC/NGF	
Glaul	25.54.62L	F3	ER/SD/WD/DMC/NZ	
Golux	38.52.15L	K4	WD/N/RDD/SD	
Gomlur	42.58.16L	K6	DMC/SD/WD/ER/LP/MR	
Hekiwi	87.50.28	F5	WD/??/??	
Hemul	25.56.76	K6		LG
Hemun	49.56.26	F6	L/N/LJ/GF/ER/CZ	
Henlur	75.62.28	F5	WB/NNZ	
Hexlun	18.44 75Q	F5	LS/CN/NZC/LJ/AC	ZC
Hexnix	42.44 28	F5	AC/N/N/MR/RDD	
Heklux	34.51.27	K4	DMC/DMC/ER/WD	
Heklul	73.21.26Q	K6	ER/LS/ERG/DMC/ER	S5R, SB
Helun	85.69 75L	P5	L/N/N/ZW/DCB	
Hemur	77.57.28	P5	RDD/SD/N/N/WD	
Henun	38.15 75	P9		RC
Henlux	46.63.26R	K4	LS/DMC/ER/RDD	L4FG
Hemur	58.39 75	K4	NZ/WD/ER/LS	QT CE; QC
Hezlur	30.45.26	K5	MR/TS/LS/TS/N	TG
Hexun	65.46.26	K6	CZ/N/ER/WD/DCB	
Hexul	40.34 75	P5	GF/DMC/ER/RDD/CZ	
Hexun	37 46.74	P5	GF/DMC/ER/RDD/NZ	
Kaslem	11 72.56R	K5	LS/WD/DMC	CE; DD6
Kamuk	60.18.56Q	K5	LS/ER/RF/TS/CB	SB, SCD
Kamlek	52.66.58L	K6	CB/CB/CZ/NZ/RDD/DMC	
Kamlen	60.56.58	K5	TS/LN/NZ	FC; QT SyE
Kamur	73.84.57	F6	TS/TS/ER/GF	
Kamzu	16.42.56R	F6	L/N/LS/RDD/NZ/ER/CZ	
Kamlek	45 90.58	15	AC/MR/TS/LP/LS	QC, FE
Kamlur	11 48.58	K4	ER/CB/GF/N	
Kamlul	72.85.56	P4	L/N/ER/ER	
Kemlek	52.43 18	K5	WD/TS/TS/N/DMC	
Kamun	55 46.91	P3	RF/TS/WD	
Kamuh	80 67 57R	F6	CP/NZ/LS/ER/TS/N	
Kamuk	35.37.57	F4	WD/N/DMC/SD	
Koklem	39.53.56	K5	LP/MR/RF/TS/LS	ZC
Kolwuk	52.53.57	F6	CB/GF/DMC/NZ/DMC/NZ	
Kolmu	43.23.56	F4	BR/TS/ER/LP	
Kumwun	11.59.53	K5	RDD/MR/NZ	
Kurul	68.29.58L	P5	WD/RCP/N/RDD	
Kuzm	16.20.58L	K6	MR/TS/N/CZ/NZ/DMC	
Kuzun	19.35.56L	P4	RF/TS/ER/RDD	
Kamuk	56.41.58R	F5	WD/RCP/LS/WD	
Larwun	83 42.27	13	GF/LS/N	RID
Larwun	31 09.37R	R4	BR/??	
Lapul	71 84.57	F3	CZ/N/TS	
Larzu	32.42.27	P5	TS/CB/CB/GF/ER	
Larzur	70.48.35	K4	MR/RDD/????	
Lexlun	64.55.25	K3	GF/WD/N/WD/TS	
Leflak	55.73.37L	P3	RR/GF/ER	
Lermlur	67 81 37	P5	ER/GF/ER	
Lermuk	52.07.36L	K5	GF/WD/N/WD/CB	
Levmur	76.67.85R	K5		I-BG
Lexlur	79.86.37	P3	ER/LP/CZ	

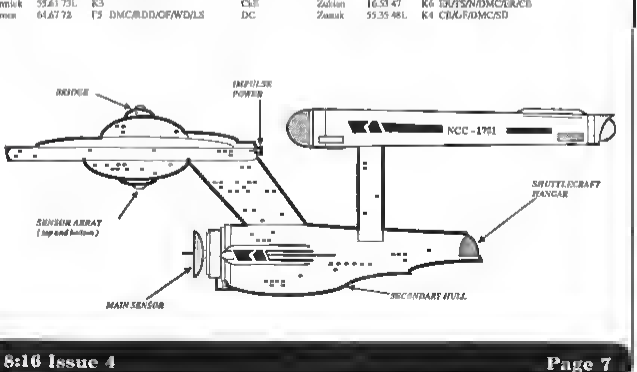


Lorraz	44 01.36	K6	NMR/R/DMGF/DMCN7		Paralon	64 00.69	P6	TS/TS/ER/N/DM/CNZ	
Loralon	56.43.37	P5	RDD/L/PN/NMR		Persion	19 48.22R	P4	CR/LS/CP/N	PC; PsyC
Lorral	71 49 36	K4	TS/DMC/ER/GP		Parasac	43.48.69	P4	ER/DM/ERGF	
Lorlel	71.25.84R	P4	LS/WD/UR/MR	LG	Parlod	72.78.70L	K4	CR/CZ/CZCP	
Lorrylak	55 61.30Z	K3	ER/RD/RF		Perrelor	31.61.21L	K3	MR/RD/D/LP	
Lasmn	44 07.84R	R6	ACLS/DMC/SD/ER/NZ	CH	Persiaz	45.31.21	K3	LS/TJ	LG
Lasmn	64 78 83R	P5		RC	Persion	64.31 70	K3	GF/ER/RD/LS/DMC	CtL; DC
Lasmn	18 37.37R	P5		RC	Persiaz	43.85.70Q	K3	CP/N/TS	
Lorzlon	57.43.55	P6	ER/NCZ/GP/ER/ER		Persul	23.37.69	P4	PCA/PDMC/DMC	
Lasmn	31.49.84	P3	LS/ER/WD		Perlion	60.73.68L	P4	TS/TS/ER/N/DMC/NZ	
Lalcm	40.53.37	R6	WB/TS/LS/RD/N/ZWD	FC; ZMX	Pasmyn	43.61.22L	R3	LP/MR/OR	
Lasmn	43.59.79Z	P4	RF/FD/ER/DMC		Persyan	56.37 70L	K6	NMN/ACR/NZ/RDD	
Lmaz	44.41.35	K3	LP/MR/TS/RD/ECP		Parnelk	52.31.09	R5	CB/RF/WD/RD/GP	
					Parrok	55.37 70	I3	PS/L/PLS	SE
Maklin	38.50.31	I3	LS/CZN	HG; FC; GOP	Palol	23 71.22L	Y3	TS/LS/NY	QC
Malm	85.68.29	K6	CB/NZWD/WB/ACN		Palm	47 71 68L	R3	DMC/RDD/RF	
Mamn	41.56.29L	P5	LS/RP/TS/ER/NZ	ZC	Persiza	58.65 70Q	K6	ERGF/ER/LS/REOD	QT; HG
Manak	58 14.30R	K3		SF	Pasen	40.29.69	P6	NZ/TS/N/NER/ER	
Marak	50.26.79	K3	N/NZ/CH						
Marsan	58.74.31L	F4	PCC/PL/SER	QT					



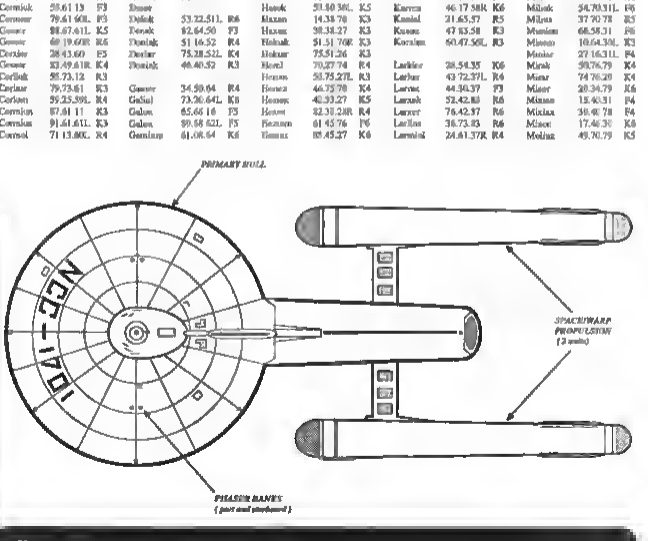
Mekar	27.51 38	K5	NZ/ER/RDD		Parun	67.83.69	P4	GF/ER/DMC/WD	
Mercer	29.57.31	K5	DMC/ER/CB/NZ/ER		Parsam	56.41.22	K5	LSC/D/MF/MR/TS	HG
Mersan	66.57.31	P4	TS/ER/N/TS/N/RDD		Pace	20 41 86	P6	KF/TS/N/NER/ER	
Mmol	73.81.31	P0	DMC/DMC/WD/TS/N/MR		Parlion	68.47.21	K3	WD/WD/DMC	
Mezar	37.49.29	K6	N/OD/DMC/WD/TS/LS	FC; SyE; ZMX; QT					
Mikel	22.52.20L	K3	ER/DMC/OD		Rakiel	22.50.39L	K4	NZ/WD/ERGF	
M'ler	78.76 77	P6	RDD/N/D/DMC/R/C/ECZ		Rakok	53.68 40L	P3	N/DMC/OD/N/LP	
Mlam	61.22.79R	K5	ER/MF/CZ/PS/LS	PC; LE	Rasac	26.14.40Q	I5	ACLS/CZ	P WD
Mmo	34.64 75	P3	CN/LS/CZ	PsyC	Raslam	10.62.38R	K4		I-HG
Moar	74.82.31	F6	GF/WD/NL/PGF/ER		Ratar	75 74.39Q	K3	LS/TS/DMC	TG
Mokak	50.52.31R	F4	OD/ER/LSCB	SE	Rasac	77 60 80	P5	NCZ/CZN/RDD	
Molen	66.70.30R	K6	CP/LS/??	I-HG	Raslan	19.44.38L	K5	ACN/NZ/WD/TS	
Molad	25.70.29L	K5	SD/WD/LS/DMC/TS	KCF	Rasac	40 82.40	R6	N/NCLN/PCC/PDMC	
Mumok	54.58.28	K6	PCC/PLS/GF/WD/ER	HG; CE; ZMX	Rekiak	51.31 40	P3	ACN/ER	
Mosin	62.64.91L	P4	OD/ER/MR/TS		Relal	25.69.39	K6	NZ/WD/CR/ODER/ER	
Mocaz	39.28.79Q	K4	ER/RDD/L/LS	PsyC	Raslam	10.62.38R	K4		I-HG
Moolen	66.82.79	K6	EP/DMC/DMC/CP/N/OD		Ratar	75 74.39Q	K3	LS/TS/DMC	TG
Mosin	34.88.31R	R3	ER/M/TS	RCF	Rasac	77 60 80	P5	NCZ/CZN/RDD	
Mosarn	61.44.31	R5	ER/LP/NCZ/LP		Raslan	19.44.38L	K5	ACN/NZ/WD/TS	
					Rasac	40 82.40	R6	N/NCLN/PCC/PDMC	
Nakiar	76.54.33	K6	NCZZL/P/M/CB/NZ		Rekiak	51.31 40	P3	ACN/ER	
Narnaz	45.66.33L	K5	NZ/ER/N/WD/N		Relal	25.69.39	K6	NZ/WD/CR/ODER/ER	
Narrex	40.30 34R	P6	WD/ER/LS/LP/GF/ER	CC	Rexnor	30.09 40L	P5	LP/LSCZ/MR/RDD	LE
Narzid	21 78.33R	P5	CZ/LS/N/RCB	FC; RC	Raslan	53.57 39	K5	RDD/CZN/ZLSCB	QT; ZM
Narsan	42.36.32	K4	WD/DMC/WD/RDD		Rexlan	63.63.40	P3	ACN/ER	
Narsm	67.84.34	P4	DMC/ER/NAC		Rexnor	58.39.38	P4	N/WD/ER/LP	
Narzar	29.42.54	P6	TS/ER/E0/LP/GF/DMC		Rexnan	61.45.40	R6	ER/MR/CP/CCP	
Narrsa	60 79.35	K6	RD0/MF/GF/WD/TS/N		Rexnex	42.58.39L	P6	WD/CR/GF/DMC/ERN	
Nerark	53.37.32	K3	NZ/ER/GP		Rimex	65 64 40	I3	N/LP/N	
Nockam	56.55.34	P6	DMC/ER/MR/RDD/L/PGF		Ribiero	81.82.39L	K5	CB/NZ/ER/WD/ER	
Narnal	68.67.34	F6		FC	Rekon	65.22.39K	K6		LG
Nerark	55 49.34	R3	CZN/ZCB		Remnik	53.11.38	K4		SC
Nokrax	48.53.34	F6	GF/DMC/AC/LP/LS/ER	HD	Renal	73.62.40	P5	GF/DMC/ER/LS/RF	FC; CE; ZMX
Nonnen	91.59.32	K4	DMC/LS/TS/ER/DD	CE					
Nonlat	33.65.34	K3	DMC/GF/N/NZ/WD		Sakiam	15.50.40R	K3	LS/ER/MR	PsyC
Nonnar	76.65.34	F6	NDMC/AC/LP/N/DMC		Sakiel	70.50.41Q	K4	ER/MR/CB/LS	LG
Nonwex	56.29.82	K5	DMC/DMCA/LS/CZ/GP		Sarmal	73.56.43	P6	LP/N/BX/WD/NZ/ER	
Nonlal	72.47.81R	K3		LG	Sarnaw	59.68.42L	K4	ER/LS/CB/OD	SE
Nonlan	43.47.34	F4	N/ER/LP/N		Sarlex	82.74.42	K4	MF/MR/TS/DMC	
					Sarna	65.80.43	P6	RDD/CZN/ER/N/WD	
Parkal	21.54.22L	K3	N/ER/CP/N/WD		Sarnew	58.51.43	P4	PS/LP/N/ER	
Parlam	60.24 69	K3	DMC/TS/ER		Sarjel	70.63 43	P4	PS/LP/N/ER	
Parlor	78 72.70R	K4	LS/ER/RF/CB	I-HG	Sikan	86.52.43	P4	ER/RDD/LP/N	
Parnel	23.60.30L	K3	WD/TS/DMC		Simarx	49.58.42	K5	ER/PCN/ZER/N	
Parnex	35.66.69	R3	CB/CR/??		Sanar	74.54 43	P4	ER/RDD/LP/N	
Parsian	31.36.84	K4	ER/ER/IR/LP		Sinyn	34.64 43Q	R3	CB/LS/NZ	RC
Parsak	55 84 70	K4	TS/ER/CP/N		Sinan	86.34.43	P5		RC

Simon	41.46.42E	F6	RD/DC/ZJ/SC/JN/ER	ZC	Vernal	69.34.73	H6	MR/MJ/AC/NC/VD/DMC	
Sokyo	34.52.41I	K3	TS/DMC/DMC		Vernon	19.37.72	F3	DMC/DMC/ER	
Solyon	90.38.43	F6	MS/CP/S/MF/CR/RF		Verner	31.49.25	F3	RD/EN/ZJ/ER	
Sormuk	54.58.90R	F6	ER/DMC/CC/ZM/TS/LS		Vesker	44.55.23	F6	OD/ER/CJ/PC/ZM/DER	
Sorrows	61.10.41R	K5		LG	Vesrovic	48.61.25L	K4	DMC/CH/MR/AC	
Sousa	85.66.41	K4		1 HG	Veyron	32.67.24L	H6	NZ/ER/CJ/NZ/WD/ER	
Sowers	46.64.42J	K3	TS/DMC/DMC		Vezniek	55.85.25R	F3		LE
Sowol	32.76.42R	F3	TS/DMC/MF		Vickson	51.37.73	K4	NZ/ER/LP/N	
Sower	20.46.42L	K6	TS/DMC/DMC/RT/CR/K P		Vieraz	44.91.73	K5	DMC/CR/CP/??/??/?	
					Vierion	40.43.25	F5	NZ/ED/MH/CJ/LP	
Taliori	66.28.67	K3	N/NZ/TS/N/DMC		Vieran	43.49.24	K3	WD/ER/RF	
Tamus	56.56.66L	F6	RT/TS/ER/TS/DMC/TS		Vulrin	67.23.73	14	CZ/ET/N/LS	GOF
Tarnus	39.74.19Q	13	LS/AC/MR	PsyC	Vuren	64.17.71	H6	TS/ER/MR/CR/AC/N	
Tassel	70.54.67L	14	NCZ/MH/CZ		Vurtex	40.65.73	K6	CZ/PC/RH/AC/LP/LS	
Tasrik	54.44.17	F5	TS/WD/DMC/MR/DD/LS	ChE	Vurut	44.29.72	F1	DMC/NZ/WD/DER/ER	
Tazius	37.44.67	K6	ER/N/MR/ DC/ZG/F		Vuseec	48.35.73	K3	PC/NZ/CH	
Tekran	15.51.19L	D	LP/LS/N	P WD	Vusnik	55.42.24	F4	TS/N/WD/DMC	
Telius	85.69.67L	K6	TS/MR/RJ/CR/MF/GF						
Tenrim	17.57.18L	K5	WD/DMC/DMC/CR/CZ		Xarmuk	55.50.44L	K4	NZ/WD/AC/LS	ZC
Terak	50.15.87R	13	LS/AC/ER	PVA	Xanial	21.66.46R	R5	NZ/DMC/CZ/LS/MR	DC
Terrok	54.33.19L	R5	LP/N/ER/GF/DMC		Xarium	60.35.45L	K3	TS/DMC/MF	
Teston	06.45.19	K5	LP/N/LS/GF/ER	SyE	Xenian	19.36.46	F4	WD/??/??/??	
Tikon	34.53.19L	K3	RD/WD/JR		Xerxiak	07.48.46	F4	WD/RD/DM/AC	
Tilul	25.70.67Q	K5	N/N/LP/LS/RDD	L-HG	Xermian	43.61.44	F3	N/DMC/WD	
Tiloc	41.22.65	F6	RF/CR/AC/N/DMC/ER		Xersul	72.65.46	R4	DM/MF/ER	
Timlee	37.58.17L	K5	CH/NZ/ZJ/WD/TS		Xersius	33.43.46	F6	LS/NZ/ER/EN/RDD	HG/ QC
Tirnar	15.26.67L	K4	NZ/ER/CP/LS	EC	Xulok	55.71.46L	14	DMC/TS/ACH	
Tisoro	17.34.65L	F6	MR/AC/LP/N/DMC/CZ		Xumen	67.59.48	14	DMC/TS/N/TS	
Tiyor	28.46.19	F6	WD/N/MF/CZ/NZ/RF		Xuner	28.17.46L	F6		LG
Tokrez	46.52.18	F3	WD/RDD/MF		Xunack	52.65.44	K6	LS/DMC/CH/RF/TS/ER	SR
Tonez	34.64.17I	F3	WD/RDD/SB		Xuran	56.28.46Q	R5	RT/RD/MC/CP/SLS	CC
Torlem	58.28.85	R3	DMC/WD/BMC		Xurus	79.83.46	14	NZ/TS/N/N	
Tonex	46.58.67	K3	ER/N/ER		Xuxen	16.41.46	F6	ER/PC/PC/PS/MR/RF	
Tonish	49.54.66	F5	TS/LS/MR/CH/AC	ZMC, LG	Xuxiez	45.80.44Q	K5	LS/DMC/NZ/WD/N	HG
Toran	41.46.17Q	K6	DMC/WD/ER/NZ/LS/ER	LE	Xumiel	72.47.44	K3		KA
Varkial	69.54.25	F5	CZ/NZ/DMC/NZ/AR		Zaelian	57.54.49	F5	N/SD/WD/N/LS	QC
Varlink	55.24.72	R4	DMC/NZ/TS/DMC		Zaeral	20.30.48R	K5		PsyC
Varlon	83.72.73L	K3	LS/RJ/TS	LE	Zaelier	79.73.47	K3	TS/WD/LS	
Varmal	71.60.24	K3	CP/ER/RDD		Zerner	76.67.49	F5	GH/CR/CZ/GH/WD	
Varmun	19.60.23Q	K4	ER/LS/TS/DMC	CC	Zerur	31.37.49Q	12	AC/LS/NZ	LG
Varnium	57.66.25	F5	CZ/NZ/DMC/CP/DMC		Zeruss	64.91.49	15	MR/VD/CZ/LP/LP	
Varnok	55.36.25	14	NLS/MR/NZ	GOF	Zeeral	20.79.46R	F6	RF/ACH/SD/DD/MC/ER	ChE
Varson	39.84.73	13	PC/CH/N		Zurrios	40.51.48	F5	NC/R/CH/N/RDD	
Varzin	16.54.25L	R6	CR/NZ/LS/WD/N/TS	HG, QY	Zowtun	67.85.49	F3	CR/GF/ER	
Varnun	67.48.25	14	N/LS/LP/GF	GOF	Zoruk	52.91.47	K5	TS/ER/NZ/WD/TS	
Vaslus	33.55.25R	16	LS/PS/LP/CZ/MR/RF	DD6	Zorsker	28.43.49	F5	NC/R/CZ/N/WD	
Verlust	67.73.73L	K3	DMC/CZ/NZ		Zorulk	55.97.49	F3	CR/LS/ER	PsyC
Vermick	55.61.73L	K3		ChE	Zublan	16.53.47	K6	ER/TS/WD/MC/ER/CB	
Vernon	61.47.72	F5	DMC/RD/DC/WD/LS	DC	Zumuk	55.35.48L	K4	CR/GF/DMC/SD	



The Un Mapped Systems

Barnum	61.56.55	K6	Corrium	57 19 61	K5	Gaeron	77.56.63L	F3	Hiaar	38.52.70	I4	Lerrium	48.61.84	K4
Banex	46 14.55	K4	Corrien	57.31 11	K8	Gamel	20.14 164	K4	Hirst	82.76.26	K3	Lernian	57 19 83	K6
Baran	62.26.55L	I3	Corran	81 31 61L	K6	Garel	70.26.16L	F4	Hiran	37.34.76	K5	Lerrier	28.19 37L	F5
Barak	50.38.52L	I3	Cosmik	55.85.61	K3	Gamar	30.44 64R	I1	Hokan	58.52.26	F3	Lerrion	57.31.37L	R6
Balam	61 69.53L	F6	Cosrex	43.49.59	F3	Gomar	87.51.62L	F3	Holar	82.52.74L	F3	Lerrion	48.45.55	F3
Kerran	17.57.53	K5	Cimar	84.17 61	K3	Golak	53.60 37	K3	Holal	73.78.27	K5	Lerrion	68.55.37	K6
Bonar	74 15.54L	I3				Gerron	85.57.64L	I5	Homin	38.64.74	R4	Lerfiel	24.73.36	K4
Barak	30.27.54L	F3	Dentrix	13.56.52	R4	Gomon	58.15.64	R4	Hosal	70.64.28	F3	Lerfion	48.73.85	K4
Barak	54.39.55L	K5	Daniel	22.62.50	R4	Gomak	51 63 16	F3	Hosal	25.34.28L	F5	Lerfion	67 73.35L	K3
Banat	22.39.54	F4	Daron	14.26.52L	K3	Gerrar	75 63.05L	F3	Hosak	53.46.28	R6	Lerrifor	79.61.35	I3
Rilma	49 70.53R	R5	Darien	46.74.58L	R4	Germa	58.27 14	K4				Lerrol	20.67.37L	R6
Rilal	73.22.55L	K5	Daraxon	61 44.51	R6	Garal	82.27 64L	K4	Kashal	21.54.58	R5	Lerrom	48.15.58	F3
Rirram	61 10 55R	K5	Daraxin	61 44 51L	R6	Gerrol	34 75 16L	I4	Kaflon	84 24.58L	K3	Lerrok	67 49.37	I3
Rirra	46 64.55L	K3	Gaxar	83 51 52	K3	Gillon	18 70 54	R6	Kaflar	34.24.58	K4	Lirror	76.29.55R	K6
Rirlel	70 19.52L	R3	Delarr	50.21 52R	K5	Gillol	73 70 64	K5	Karrsal	23.60.57	R3	Lerrior	57 77.37L	R5
Rirrax	39 28.54	F4	Delrin	85.21.52L	F6	Gyrol	70 64 62L	F3	Karrsat	46.78.11	R3	Lirrlos	56.36 37	I3
Rirron	41.24.55	I6	Demar	26.15.56L	F3	Girrax	46.16.64	K3	Karrsan	09 66.38	K5	Lassen	59.83.36L	I3
Rirlar	27.40.53	F4	Dermen	16.63.52	K4	Gimak	51 40.64L	K4	Kerrlar	70 78.58	K6			
Kerrin	58.40.07	R3	Gemrie	58.27.51L	K4	Gimron	51 70 67L	F5	Karrar	40.42.10	F6	Marar	74.26.30L	K3
Rirrar	29 66.55	I5	Demar	75 75.52	K3	Gomak	51.28.62	I4	Kerrin	67.25.58	I3	Mamani	61.50.29L	K6
Rolrar	78 70.55	K6	Demrick	61 33.52L	K6	Gaman	63.40.63L	I4	Kerron	40.67.38	R5	Mamin	62.38 79	K3
Rorak	50.64.07	F4	Denal	70.39.50R	R4	Gamal	22 40.62	F3	Kerrlen	64 19.57	R3	Manal	32.38 79	K4
Rorar	74 64.53	F4	Genore	18.45.52	K5	Gamin	40.40.16	F3	Kerral	68.79.58	K6	Manen	46.38.39	K4
Rerlen	38.28.59L	K5	Demal	73.46.53	K6				Kerrin	16.79 58	R5	Manen	66.44 77	R5
			Dikra	82.52.52	K3	Hakiew	63.50.75	F3	Kerron	47.37 58	K4	Melnon	66.21.24L	R5
Carlorn	59.72.60L	F3	Danar	38.64.52	K4	Hakeel	22.50 74	R4	Kerlon	35.49.58	K4	Melon	41 69 31L	R5
Carrer	70 18.59L	R6	Dirun	14 76.52	I4	Hakian	46.50.28	R4	Kaelon	34.75.58	K4	Merrum	61.57 77L	R6
Carrek	52.30.59R	R6	Durel	70.76.52	I3	Haler	37.68.27L	K6	Kaelrik	53.25.56L	R3	Memax	39 63.28	K3
Carrak	55.36.61L	I4	Dirux	49 34.52L	K5	Harlak	51 79 28R	F3	Koerier	76.31.58R	K5	Meran	34.29.31	F4
Corker	76.55.61L	K5	Dirnik	51 40.64	R4	Haaren	61 32.75	R6	Kalun	67 71 58	K4	Mikal	28.52.28	K3
Cermak	58.61 13	F3	Emor			Hanok	50.80.30L	K5	Kaeren	46 17.58R	K6	Milnik	54.70.31L	F6
Cermor	79.61 60L	F3	Delnik	53.72.51L	R6	Haxan	14.38 70	K3	Kanial	21.65.57	R5	Milyn	37 70 78	R5
Cermor	88.67.61L	K5	Derak	82.64.50	F3	Haxan	38.38.37	K3	Kanon	47 63.58	K3	Mamlen	68.58.31	F6
Cermor	60 19 60R	R6	Dranik	51 16.52	R4	Hinak	51.51 70R	K3	Kaenlen	60.47.56L	R3	Mamin	10.64.30L	K3
Cerdor	28 43.60	F5	Drelar	75.38.52L	K4	Hakar	75.51.26	K3				Monlar	27.16.31L	R4
Cermor	83.49.61R	K4	Dranik	46.40.52	R3	Horel	70.27 74	R4	Larlelar	38.54.35	K6	Marak	59.76.79	K4
Corlark	85.73.12	K3				Hermon	58.75.27L	R3	Larbar	43.72.37L	R6	Mamar	74.76.20	K4
Carlaar	79.73.61	K3	Gamar	54.50.64	R4	Horrer	46.75.70	K4	Larrac	44.34.37	F3	Minor	20.34.79	K6
Carlarn	59.25.59L	R4	Galal	73.20.64L	K6	Horrox	42.33.27	K5	Larrark	52.42.80	R6	Minnan	15.40.31	F4
Carrrlan	67.81 11	K3	Galon	65.66 16	F5	Horrer	82.31.20R	R4	Larrer	76.42.37	R6	Minlan	30.40 78	F4
Carrelan	91.61.61L	K3	Galen	90.68.62L	F5	Hermon	61 45.76	I5	Larlan	36.73.42	R6	Minor	17.46.29	K6
Carrsol	71 13.80L	R4	Gamlan	61.08.64	K6	Hinnix	85.45.27	K6	Larrelar	24.61.37R	R4	Molrar	49.70.79	K5



Mauritor	78.58.79	K6	Ranjen	34 17 40	R4	Venom	45.37.25	P5	Xenlon	16.78 44	K5
Meenaun	13.58.90L	K5	Rilior	30.70.38	P6	Verdiun	57 43 73	P6	Xenlon	79.46 45	K3
Merel	22.70.77	R3	Rukar	26.52.36L	K4	Vexaun	59 48 72	R4	Xirlon	64.53 45	K6
Meret	46.76.51L	P5	Rumkin	30.58.40R	R6	Vexon	13 49 25	R4	Xulgen	64.53 45	K6
Merial	70.28.29L	P5	Ruran	14.76.39	K4	Vorkun	64.55 73L	K5	Xulior	31.23 44L	K4
Mesilor	27.40.75	K4	Rurel	70.70.28	R3	Vorlon	59.25.24L	K4	Xulon	11 71.46	K5
Meuraun	58.40.38	P5	Ruvez	46.28.40	R3	Vorlur	31.25.73	K3	Xumkin	45 11.45R	K4
			Ruzur	75.40.40	R4	Vorrer	76.67.23	K5	Xurrel	23.59.46R	R3
Narkun	33.54.32	K5	Rzulen	34.40.49	R	Vorrior	28.31.25R	P5	Xuzun	35.83.45	P5
Narlen	35.54.32	K5	Rzulgen	61 94.40	P5	Vumlen	16.43.72	P5			
Narlud	72.24.31L	K3	Ruzun	77.46.38	K6	Vulrian	81.57.71L	K5	Zaelen	48.24.09L	R
Narlun	34.24.57	K6				Vuzun	83.59.73L	P5	Zaeril	66.66.49	P5
Narlux	47 72.34L	P5	Sakkus	37.20.49	K6	Vuzun	16.85.23L	K6	Zaerlen	16.66.49	R6
Narreun	55.60.34	R5	Samarr	17.56.45	R5	Vurial	60 77 73	K5	Zarnal	24.36.49	R
Nasual	68.18.34L	P5	Sarak	50.26.45L	R3	Vuzas	32.41.71	P5	Zarnuk	55 48.49	K4
Naureen	66.69 02	K4	Sarjar	27.74.41L	K5	Vuzlen	36.47 73	K5	Zarkaz	44.55.49	R6
Narriaz	45 78 82	K5	Sarnek	54.32.41L	K5				Zarrek	32.79.49L	P5
Narsaz	66.78 52L	K6	Sarur	21.80.45	K5	Xarkaun	09.54.46	R5	Zarzun	43.49 46	R
Narriel	72.36 82	K5	Sarzun	15.61 45	R	Xarlal	23 72.44L	K3	Zarkur	76.55 47	K5
Narzuun	68.48 82	K3	Sasuk	54.45.45	R5	Xarlen	67 72.45L	K4	Zarlen	48 73 49L	R4
Narzus	84.48.32	K3	Sakur	46.52.45	R3	Xarreun	11.80.45	K3	Zarlol	71.25.47L	K4
Narzur	31 48 55	K4	Silion	37.70.41	K5	Xarsut	49 18 45	K6	Zarrilon	36.61 49	K4
Nasrulun	43.61 11	R5	Sirak	80.76.45L	P4	Xarsuz	45.66.32	K5	Zarsuz	44 67 47	K6
Nasrur	46.43 80	P5	Sirlok	54.32.42L	K6	Xaslen	16.30.45	K6	Zarzul	69.14 49L	R6
Nerlial	73.73.32	K4	Sraur	29.34.43	P6	Xaslen	47.84.44	K3	Zaseu	64.78.48	K5
Nerreun	40.67.81	R5	Sraur	85.34.43R	P5	Xaxaun	56.42.46	P5	Zaurur	43.37 49	K3
Nersul	23.37.34	P4	Sraun	62.88.43R	P4	Xerlios	64.73.44	K4	Zaurur	31.49 47L	K3
Nersur	47.37 80	P4	Srulen	39 40 41	R4	Xerlur	31.73.45L	P5	Zaltul	69.53.48	K5
Nialzur	45.53.32	R	Sunek	66.94.41	K6	Xerraun	56.79.46L	P6	Zaraun	16.58.45	R4
Nolial	56.71.82	K4	Sukur	74.52.42	K4	Xerrios	33.31 44	K6	Zaraun	57.65.47L	K5
Nulur	70.71.33	K4	Surrior	78.58.43	P6	Xeruun	60.85.44	K4	Zarur	81 77 47	K5
Nurreun	67.59.82R	K4	Surun	62.76.41L	R4	Xerxun	45.43.45	K6	Zarur	28.77.45	K6
Nusilur	52.65.81	P6	Susur	41.34.41	K6	Xodor	76.43.40	R5	Zaxur	33.83.49	P
Nuzlun	52.77.34L	P5	Suzuk	30.88.42	K4						
Nuzzun	60.35.80	R5	Szulen	56.40.89R	K5						
Nuzur	31.35.34	P4	Szuzu	85 46.41	K5						
Paurulel	72.12.68	R3	Tahlen	82.50.67L	K4						
Perreun	67.60.21L	K4	Taraz	62.36.18	P3						
Perrux	41.60.70L	K4	Tirzan	15 74.67	P3						
Parraun	56.15.79	K5	Tzulen	66.32.18	P5						
Parrun	56.30.21	K5	Tzulur	49.32.67	K6						
Parrur	28.30 79	K6	Tzuur	50.38.10	P3						
Paulen	49 42 70	K6	Tzuzu	31.51 60	R3						
Paurux	40 79 64	R5	Tukul	70.51 18	P4						
Parsul	21 51 70	K6	Tulok	54.21 65	R5						
Paulen	47.37.32	P4	Turzul	71.57.17	K6						
Paulux	35.25 70	K4	Tzulen	58.65.18	14						
Pauraul	72.61 69L	P4	Tzuun	82.63.66L	P4						
Paurlal	21.45.69	P6	Tzuun	58.75.66L	P4						
Paurlen	64.43.68	R5	Tzuun	61.81.67	K6						
Paulun	52.53.20	K6	Tzuun	40.45.66	P6						
Paurux	76.53 70R	K6	Tzkur	74.52.18	P4						
Pulmun	19.29.70	K4	Tzurrun	13.58.67	K5						
Puraulk	58.59.22	P4	Tzuzu	62.64.65L	P4						
Paulun	79.59 68L	P4	Tzul	73.34.66	P5						
Paual	68.17.68	R5	Tzuur	27.40.18	K4						
Paulun	64.66.21	K4	Tzuun	61.46.65	R5						
Paual	58.29.22L	R5	Tzkul	52.52.67L	K4						
Paaun	30.41 69L	R5	Tukul	22.52.67	K5						
Paulun	84.47 70L	K3	Tzkur	78 70.18	26						
			Tzkur	29.22.67R	20						
Raluun	13.68.80	20	Tzuzlur	86.58.65L	P5						
Raulun	09.56.40	P5	Tzuun	27 16.66	P4						
Raaual	25.56.40	26	Tzuun	61.34.67	R5						
Raulur	54.62.81	P4	Tzuuo	17.46.67	R6						
Raaun	58.26.69L	P4									
Raulun	51 74 88	K5	Vaulun	09.34.66	P5						
Raulun	42.21.40	P5	Vaulur	11.66.71L	P5						
Raluu	65.69 58L	K5	Vaurur	76.30.73	K6						
Relur	49.69.88	K5	Vaulur	76.55.25	P5						
Reuraun	15.57.38	K6	Vaulur	43.25.72	P5						
Zaraur	58.15.38L	K5	Vaurun	79.61.25	R3						
Raulun	46.75.40R	K6	Vaxun	44.67.25	20						
Raaur	49.81.39	K6	Vaxulur	40.10.73	K5						
Reuar	26.39.48	K3	Vaxulur	48.65.79	K4						

Key To Planet Types

AR	Archive Complex
CB	Communication Beacon
CP	Catastrophe Pods
CZ	Contamination Zone
DMC	Dilithium Mining Complex
ER	Energy Refinery
GF	Gamma Field
LP	Leeching Pits
LS	Life Supporting
MF	Metabolic Field
MR	Masonic Rings
N	Neuromorph
NZ	Nebulous Zone
OD	Orbital Discontinuum
PC	Pilonic Core
PS	Planetary Supermind
RDD	Repair Drone Dock
RF	Robot Fortress
SD	Siren Device
TS	Tracking Station
WD	Weapons Dump

Picture Credits

Klingon Battle Cruiser Page 6

Klingon Battle Cruiser

Gary M. Keto 76074,1020

Starship Enterprise. Page 5
Page 7
Page 8

Created on Macintosh™ with MacDraw™

George Carmon — November 1984

Information source
the 1700 FIDDY Technical Manual © 1975 Franz Joseph Designs

The pictures used throughout this article were taken from the Great Trekkie and Final Frontier disks available from the Translatum International PD Library for the Macintosh range of computers.

Software Roundup

ST

Heroes of the Lance is due for release later this year. This will be the first program to be released by the partnership of *U.S. Gold*, *SSI* and *TSR* and is based upon the *Advanced Dungeons and Dragons* role playing system.

Trip-A-Tron is new being advertised as available. Look out for the reviews that are certain to appear within every ST related magazine. Also of interest is the forthcoming *Electronics* where *Jeff Minter* will be using 5 STs to add visual enhancements to music by *Adrian Wagner*.

Rudgie UK have announced more PD software to be released soon. They include *Mad Hat*, *Maneyspinner Shoelstrom*, *Speculator* and *Final Gasp*. The four original titles *Football III*, *Damonoid*, *Blue Hi* and *Othello* are now available as a pack along with a new title called *Pro-Darts* all for £12.

Electronic Arts are to release *Starflex I* for £24.95. It will and see how big this one is before I promise to produce a star chart!

Activision have released *Mindfighter* complete with a full length novel. I wonder which will be the most interesting the game or the book. Also available is ***Knightmare*** an arcade adventure based upon the children's TV programme of the same name.

Firebird have released a space game called ***Pandora***. Your aim is to salvage alien artifacts and disable the spaceship Pandora. Also available as a game described as *a sort of pony express in space*. The game is called ***Whirligig***. You can also buy *Virus* the ST version of the *Archimedes* title *Zarch*. All these Firebird games are available at £19.95.

Rainbird have release *Carrier pigeon* and *Smuggler 2* and the Silicon Software pre-start *Legend of the Sword* all for £24.95. Included in the package for *Legend of the Sword* (along with the two disks and play guide) is a short story called *Tales Of Mavenix Lost* by *Andy Slorer*. The on screen mapping on this RP adventure is superb.

Infogrames have released *Captain Blood* for £24.95. The graphics are superb and the music is not bad either.

Elite have released *Space Harrier* for £19.99, which is room-up conversion. They have also released the most addictive game I've seen this year. *Buggy Boy* is a must for everyones collection.

Go! Media Holdings have released a street fighting game called *Street Fighter* how original. You know I sometimes wonder if games like this are re-enacted in the streets of Germany and on the football terraces here.

Incentive Software have released *The Atari ST Adventure Creator* commonly called *STAC*. The format is identical to *Codewriters Adventure Writer* available on the 8-bit, but with the addition of a font editor and the inclusion of graphics. *STAC* is available for £39.95.

Infocom have released *Beyond Zork* for £24.95. The on screen mapping and status window make this adventure a treat to play, though the movement of rooms each time you play from scratch is a bit disorientating at first.

Northstar is the new game from *Gremlin Graphics*. This one is converted from the Spectrum original.

If you fancy a gamble every so often then *Casino Roulette* from *CDS Software* might suit you better—yes that's loose even if you loose!

Colin Hunt

8-bit

If you haven't seen it, you haven't been looking. *Atari* are once again selling software—he's re-releases. The titles available on ROM for £14.99 are *Archon*, *Ballblazer*, *Blue Max*, *Flight Night* and *Rescue On Fractalus*, while on cassette for £4.99 are *Twilight World* and *Thunderfox* and a *Compilation Cassette* containing *Centipede*, *Star Raiders*, *Missile Command*, *Tennis* and *Typo Attack*.

Zeppelin Games have released *Zybex*, (reviewed on Page 6 as *the best budget game of all time*.

Rainbird have released *Jinxter* for £16.95 on disk.

Atlantis have released three games on tape for £1.99 these being *Spooky Castle*, *Cops and Robbers* and *Day Light Robbery*.

If you watched the European Football Championships recently then *Tynesoft* a new release *European Soccer* is for you. A must at £12.95 (disk).

Another budget label, *Alternative* have two new titles *Leapster* and *Castle Top*. Both are available at £1.99 on tape.

Talking about budget, the masters *Mastertronic* have released *Revenge II*. Once again this is available for £1.99 on tape.

Finally *Infocom* have released *Sherlock Holmes* for the 8-bit Atari for £24.99.

Colin Hunt & Thomas Holzer

VCS

Just like *Atari*, *Activision* and *Imagic* have re-released their games cartridges for the VCS. Titles re-released by *Activision* include *H.E.R.O.*, *Enduro* (one of the best racing games ever produced), *Chopper Command*, *Laser Blast*, *Grand Prix*, *Dragster* and *Skiing*. Titles re-released by *Imagic* include *Atlantis*, *Firefighter* and *Subterranean*. All titles are available for £9.95.

Telegames have re-released an old *Konami* title called *Kung Fu Superkick*. Maybe collectors would like to know that it's an O.K. game, but nothing to rave about.

There are rumours that *Atari* are finally to release *Gremlins* in the UK. now that would be something!

Thorsten Holzer

California Games

(Epyx - £14.95)

So, here it is, the third in the game series from Epyx, California Games for the VCS 2600 or 7800 (if you are lucky enough to own one). Like summer or winter games, Epyx have done a good job again. There are four events this time and as the title says they are a bit different. We have Foot Bag, Half Pipe Skateboard, BMX Bike Racing and Surfing. California Games can be played from one to eight players, with the object of the game to win ribbons in each event and compete for the top overall score. Again, this cartridge comes with a nicely made up instructions manual telling you everything about the game and even how to speak Californian (oddie slang - "Hey, trasher! Dontcha ever wear knee pads?"

Okay, let's get on with the games. You plug the cartridge in and are greeted with the title screen and credits while a catchy little tune plays along. There is also a good graphics demo showing the capabilities of the VCS. Pressing fire takes you to the sponsors select screen. The eight sponsors are Epyx, Delmer, Jeuks, St Cruz, Op, Casio, Auzzie and Spunjm. Move the stick up and down to the sponsor of your choice and press fire. Select *done* when all the contestants have picked their sponsors and let the games begin.

The first event is Foot Bag. In this event you have to keep your balls up! Well, not quite, its like juggling with your feet. You have to keep a bag up in the air for 90 seconds without using your hands. This one is easy and you gain extra points by doing some tricks like a headbut or knockkick. Not much to say really. Graphics are good and game play is relaxing. I like it.

Half Pipe Skateboarding also has a time limit of 90 seconds. But here you have to build up speed and complete stunts. Points are given for each successful stunt and the highest score wins the event. Press fire to start the game and gain speed by pumping the joystick down when the skater is going down and up when he is going up the pipe. To do a stunt move the stick left and right, up right and up - in both. Very confusing is the whole thing, but lots of fun. You can also ride the skateboard with your hands, but I haven't figured that one out yet. Once again highest score wins.

BMX stands for Bicycle Motorcross, ha, I never knew that, but its a radical action and challenging competition. The object of BMX Bike Racing, or should that be Bicycle motorcross bike racing - doesn't sound right somehow! Anyway, the object of this event is to cover a given course in the fastest time, performing stunts and avoiding or jumping over obstacles. The fastest rider wins the game. You press fire to start and hold the stick right to increase your speed. Press fire again and you can jump and by pushing the joystick left, you brake. When you are in the air you can use your joystick to perform stunts like flip. Timing is very important, otherwise you'll end up with a tree in your face because you came down too early. One bad feature in this game is if you reach the end of the picture the screen scrolls to the next and there might be a treasure in your way or a skull face? But still a very funny game.

With Surfing you have to stay near the curl of the waves and direct you board smoothly at high speeds. Ride the face of the wave, move back and forth and in and out of the tube. To steer the board of the surfer to the left move the joystick up and to move it right, move the joystick down. Press fire for a sharp turn, but watch out if you are too close to the bottom of the wave or else you'll end this ride and get a bit wet. For extra points jump in the air and turn your board completely around or around by pressing the stick up or down. You've got 90 seconds for this event and gain points for staying on the board as long as possible. I think this event is the weakest of the four, but it is still playable.

Well that's it from the California Games. The whole cartridge is well worth its hard earned cash, so go out and grab it dude!

Jr. Pac-Man

(Atari Corp. - £12.95)

So here we finally have the whole Pac-Man family available for the VCS games machine. It started back in 1981 with the original Pac Man cartridge and continued in 1982 with Ms. Pac-Man. Both games where a big hit for the VCS. I remember going to a friends every Sunday afternoon just to play Pac-Man, it made my fingers ache.

Well I guess Mr and Ms Pac-Man knew they were getting the old chasing ghosts in mazes, so they fooled around on a sunny day and thus we have Atari's latest Pac game - Jr Pac-Man.

So what is there to say about junior? Not a lot really. It's Pac Man with a scrolling maze, better graphics and musical intervals between levels. There are also bonus items to collect, for example a tricycle, a kite, a drum, root beer and so on. These items also change 10 point dots into 50 power dots. It is therefore important to allow them to transform as many dots as possible and still have junior eat them before they destroy his power pills. No Pac game would be complete without the ghosts. Here we have Inky, Blinky, Pinky and Tim chasing you like mad around the seven different mazes, each with four different skill levels. Oh yes, this game is twice as fast as the original Pac games which makes it a bit more challenging.

A game really for people who don't own either Pac-Man or Ms Pac Man as both.

Just brought the best game this century? Want to tell us about it? Then send a review to 8-16.

The 8-bit Mouse

by Graham Bloomfield

Welcome to our first article on The 8-bit Mouse. Over the next three issue of 8:16 we will describe how you can use a normal ST mouse with you 8-bit Atari. Within this issue we present the object file loader routine along with instructions on the routines use. The next issue of 8:16 will detail the machine language source routine, while the final part will provide a full featured drawing program which supports the mouse.

The idea of using a mouse on the 8-bit Atari has now come to fruition with the effective low cost ST mouse, typically £25 from Silica Shop. The idea for this machine code program is based on an article in ANALOG Computing, March 1986.

The program listed will generate a binary file which must be loaded from disk when you want to use the mouse routine. The routine works with the mouse plugged into joystick port 1 and supports both mouse buttons, though only the left-hand button works without modifying the mouse.

To use the mouse program you must first reserve some space at the top of memory by poking 106,$80. Then select the required graphics mode, clear memory from $8000 to $BFFF and finally load the mouse routine using the Turbo Basic command BLOAD.

Once the routine is installed you must assign a 3 byte string, within BASIC. The first byte is the state of the button, 0 for up, 1 for down, while the last two bytes are where the X and Y positions of the mouse pointer are returned. All values are extracted using the ASC command, eg:

```
BUTTON=ASC(MOUSE$(1,1))
```

returns 0 or 1, depending upon the state of the button.

Initialization of the routine is done by the following command.

```
X=USR($8400,ADR(MOUSE$),COL)
```

where MOUSE$ is the positional return string and COL is the colour of the pointer.

The pointer is the fifth player built by using all the missiles. Thus you cannot use the missiles within your program if you want the mouse pointer to be present.

There are two ways of controlling the mouse pointer. This is done by setting the control code to either $00 or $01 when calling the mouse routine. With the control code set to $00 the routine will wait for you to hit the left button before returning to BASIC, while with the control code set to $01 the routine will return to BASIC as soon as the mouse is moved, thus providing a polling type of routine. Calling the routine is performed by the following command:

```
X=USR($8400,CONTROL_CODE)
```

Some additional advice on using these routines:

1. The polling control option is only suitable if the Basic program is to be compiled.
2. There is no repeat feature on the button.

The following sample listing shows how to set up the mouse routine and then enters a loop which continually reads the positional values and button.

The routine that produces the object file TBMOUSE.OBJ is listed opposite. When the program is run each data line is check before the file is produced.

```
100 REM Demo of 8-bit mouse
110 REM Object by Graham Bloomfield
120 REM Basic by Colin Hunt
130 --
140 REM Move RAMTOP pointer to page $B0
150 POKE 106,$B0
160 REM Set graphics mode
170 GRAPHICS 0
180 REM Clear out player area
190 POKE $B800,$0
200 MOVE $B800,$B801,$07FF
210 REM Load object code
220 BLOAD "D:TBMOUSE.OBJ"
230 REM Initialize return string
240 DIM MOUSE$(3):MOUSE$="000"
250 REM Initialize mouse routine.
260 REM COLOUR = colour of pointer
270 COLOUR=$46
280 X=USR($8400,ADR(MOUSE$),COLOUR)
290 --
300 REM Loop calling mouse routine
310 DO
320 REM Mode options :
330 REM $00 - wait for left button
340 REM $01 - wait for movement
350 MODE=$00
360 X=USR($8400,MODE)
370 BUTTON=ASC(MOUSE$(1,1))
380 X_POS=ASC(MOUSE$(2,2))
390 Y_POS=ASC(MOUSE$(3,3))
400 ? BUTTON,X_POS,Y_POS
410 LOOP
420 --
```

```
100 REM >Routine to produce TMMOUSE.OBJ
file.
102 REM >Object by Graham Bloomfield.
104 REM >Basic by Colin Hunt
106 --
110 DIM STRING$(24)
120 PASS=0:LINE=6999
130 DO
140 LINE=LINE+1
150 TRAP 490:READ STRING$:IF STRING$="*" RESTORE LINE
160 READ STRING$,CHECK
170 IF STRING$="*" THEN EXIT
180 TOTAL=TOTAL+CHECK
190 FOR I=1 TO LEN(STRING$)/2
200 CHECK=CHECK-I*DEC(STRING$(I*2+1,I*2))
210 NEXT I
220 IF CHECK<>0 ? "Invalid check data on line ";LINE
230 PASS=1
240 ELSE
250 ? "Line ";LINE;" OK"
260 ENDIF
270 I=I+1
280 UNTIL NO_DATA_LINE_RETURN
290 LOOP
300 --
310 REM >Here when all DATA lines read.
320 TRAP 40000
330 IF CHECK<>TOTAL
340 ? "Error in overall checksum!"
350 PASS=1
360 ENDIF
370 IF PASS=0
380 ? "Writing object file TMMOUSE.OBJ"
390 OPEN #3,8,0,"D:TMMOUSE.OBJ"
400 FOR J=5000 TO LINE-1
410 RESTORE J
420 READ STRING$,CHECK
430 FOR I=1 TO LEN(STRING$)/2
440 PUT #3,DEC(STRING$(I*2-1,I*2))
450 NEXT I
460 NEXT J
470 CLOSE
480 ? "Object file written."
490 ELSE
500 ? :? "Object file not created."
510 ? "Please check data statements."
520 ENDIF
530 END
540 --
550 REM Here if DATA line missing
560 NO_DATA_LINE
570 ? "Line ";LINE," is missing."
580 PASS=1:TRAP 40000
590 GO( NO_DATA_LINE_RETURN
4999 --
5000 DATA FFFF00FC45B469C902F03468,10124
5001 DATA 68C900F01320D3B4ADCC84C5,12689
5002 DATA 00F0F6AD4402AA4301200B24,9230
5003 DATA 8ECD844C35B420D3B4AD8402,9473
5004 DATA AA49012DCD844ECD84F0EF20,12271
5005 DATA 63B560886D0D84686DCFB468,11777
5006 DATA 688DD1B4AECF0468C705ACD0,13356
5007 DATA B48C60B5E8D001C868E6D58C,11550
5008 DATA 6EB5E0D001C85B73B5C7485,11596
5009 DATA A5286D7D4A2FFA3009D00B8,9971
5010 DATA CA10FAE8A005B9C0B49D00B8,11007
5011 DATA E88810F6ADD1348DC702A911,9917
5012 DATA 8D6F02A000A2088CC7B420AE,9188
5013 DATA B4ADD0D38DC8B48D1D00A936,10511
5014 DATA 8D2F028D00D4A5018D1DD060,8267
5015 DATA 8EC6B48A186530A2038D04D0,8149
5016 DATA 6902CA10F8600010A0C0E000,8547
5017 DATA D3B475B5AD00D38DC9B4ADC8,13028
5018 DATA B40A4D6B2428A8DCB34ADC8,11509
5019 DATA B44DC9B46DCA844A8DCA8420,10035
5020 DATA 850DCBB4AA8D53B50CBAB4B9,12344
5021 DATA CCB4ADC9B48DC8B44ECB8490,12813
5022 DATA 0CAEC7B4F0074EC884CA4C25,10809
5023 DATA B54ECB49017AEC7A868FE30,14100
5024 DATA 10E88EC7B4A005B9C0B49D00,10332
5025 DATA B9E88810F64ECB845005AEC6,11358
5026 DATA B4F804CA20AEB44ECB84900B,9911
5027 DATA AEC6B4E05FB8048520AEB460,10901
5028 DATA 0004000810501E300040008,298
5029 DATA 0206020AADCD848DCF284ADC6,12485
5030 DATA B48DCF84ADC7B48DCF846000,10569
5031 DATA BC00BCEA30BD00BDE0D0E80,8530
5032 DATA B8EA00BF00BFEAE002E10200,8288
5033 DATA B4,180
5034 DATA *,344821
```

BaPAUG News

Firstly, those of you who missed the July meeting missed a very entertaining night of music. Both the ST and 8-bit computers were used to display several different types of music software, ranging from MIDI applications to sound effects.

Next, will all members please remember to bring their subscription monies to the AGM, which is being held at the Kirsten Community Centre on the 2nd of September. The meeting will be in the Skittle Room (as those above!), as will be all future meetings.

Once again, the AGM will be at the Akron Users Show. This time, however, Akron UK are going to look after the arcade area. The AGM has therefore been asked by DataBase Publications, to help run the show. For information stand. If you be a good knowledge of products and suppliers and are willing to help then let me know, as I am off on Ken Wood of the possible numbers.

If you are going to the show please use a copy of the add on the back of this issue of ST 16 to purchase your advanced order tickets.

Finally, articles for the next issue of ST 16 are due by the 21st of October. Sorry for the delay in receiving this issue.

Colin

Tari-Talk

Reviewed by Colin Hunt

Tari-Talk is one of the first packages to come from Page 6 Software, a new label set up by the Page 6 magazine, to promote a range of utilities applications and educational software for the 8-bit Atari computers. The other software titles currently available include 10-Print, a 1029 printer utility and Spell Me, an educational program aimed at 3 to 5 year olds.

Using a cable connected between joystick 1 on the 8-bit machine and MIDI IN on the ST Tari-Talk allows you to transfer files from the 8-bit to the ST. It does not allow you to transfer files from the ST to the 8 bit though I cannot think of any sensible reason why you would want to do this!

To use Tari-Talk you have to load two programs one for the 8-bit and one for the ST. The 8-bit program acts as the server, with the ST being the receiver. Each program has three options, these being:

1) Receive/Transmit a BASIC LST file

2) Receive / Transmit a wordprocessor file

3) Receive / Transmit a DOS file

On the ST there is an additional option which is '0) Exit to desktop'.

Both programs are easy to use with detailed on screen prompts. The completed package is well presented with the two disks and instruction manual stored within a solid plastic flip lid box. The documentation is concise and easy to follow. One read through will be all you need.

The first two options transfer ASCII files with each performing a different translation on the 8-bit carriage return character. The first replaces it for a true ASCII Carriage return followed by a line feed while the second replaces it with a true ASCII CR only. The translation is done by the 8-bit, thus making it possible to use either receive routine on the ST without any difficulties.

Option 3 transfers any file that appears on the 8-bit directory - including picture files, binary files and BASIC programs. When using this option you are required to input a value between 0 and 255 which is not located within the file being transferred. Deciding upon this number is made easy by the use of a 'Check file for unused number' option. It would therefore appear that you cannot transfer files which use all 256 numbers, though what the chances of this are I do not know. In order to transmit a file with all 256 binary numbers a technique called bit-stuffing and bit-stripping could of been used. This additional programming shouldn't be to difficult as the technique is used by many different communication protocols, including HDLC which is the basis of X.25.

When transferring the files both machines print the file to screen. Both options 1 and 2 are ok on the 8-bit, while option 2 on the ST prints each line on top of the previous one - no line feed character inserted. This is a pity as the simple inclusion of a LF character while printing to the screen would of greatly improved the presentation. Printing the file to option 3 to the screen, is quite frankly pointless. The 8-bit randomly moves the cursor over the screen printing all over the place with the occasional beep, while the ST prints a stream of dots with an occasional valid character. Of course if you were transferring ASCII files using this option the screen display would mean something. Its a pity the screen outputs could not be turned off as this may also decrease the transfer time.

All transfers are completed when two checksums appear on the ST and the 8-bit proudly announces 'Transmission Completed'. One of the checksums is the one sent by the 8-bit the second is a checksum produced by the ST. If the numbers are different then an error has occurred and you have to re-transmit the file though you are given the option of saving the file if you wish.

The selected file is not sent as one continuous data stream but is grouped together into packets. This gives the ST time to receive each packet and display it on the screen and the 8-bit time to read the next part of the file from the disk after it has also displayed the transmitted packet. There is also an test to see if the ST is connected the 8-bit just blindly transmits the packets completing with the 'transmission completed' message.

The programs do transfer the files as stated, though there are some funnies.

Option 1 will not transfer a Macro Assembler source file, while option 2 will. When using option 1 the last part of the file is not received by the ST though the 8 bit has stated that the file has been transferred.

Occasionally the use of option 0 (the return to desktop option) on the ST causes the ST to crash with two bombs. I have so far been unable to pin down the exact circumstances behind the crash. Also use of this option with no disk within the disk drive results in a desktop and the alert 'Drive A did not respond'. I'm sure this could have been avoided.

If you make an option selection on the 8-bit with no disk within the disk drive the program crashes with 'ERROR - 139 AT LINE 3200'. This could so easily be avoided with TRAP statements and error handling routines, resulting in the message 'Please insert disk into drive 1 instead' ie. the crash.

Some of the picture files that I've transferred have appeared partly scrambled when loaded into DEGAS Elite even though the checksums have indicated that the transfer was successful.

The 8-bit program is written in Atari Basic with a couple of machine code routines used for transferring the data. When used within Turbo Basic using option 1 (I didn't try options 2 and 3) the 8-bit screen would go blank. The file would be transferred with output on the ST screen only. Correct checksums would appear and the 8-bit would proudly announce that it couldn't find the file on the disk! This is an oddity due to some interaction between the language and the program, how and why I have yet to discover.

All in all, I feel the package is well worth the £6.95 price tag. It will most certainly help me with future issues of 8·16.

One final note. Tari-Talk is NOT public domain. The only authorised copies are for back-up purposes only. Make sure you remember this when showing it to your friends.

Since the last issue of 8:16 I've had several request for information on the values required to produce music with the OSOUNC command within Turbo Basic. OSOUNO is an enhanced version of SOUND that allows the use of 16-bit resolution at the expense of channels. There are several references for the correct values for normal 8-bit music, but none for the 16-bit values required for Turbo Basic. Hopefully that article will correct this situation as well as giving an insight into how the Atari 6-bit computers produce sound.

In order to answer the specific question Table 1 details the required values for both 8 and 16-bit music along with the actual frequency produced and the resultant error measured in % flat or sharp. A note which is either 50% flat or 50% sharp is midway between two notes on the musical scale. The output frequency produced has to be within 10% of a notes nominal value for it to sound acceptable.

Looking at Table 1, the first thing you will notice is that 16-bit music gives you a greatly increased octave range and a far higher accuracy.

To understand why these values are required it is necessary to have a little knowledge on how the POKEY chip within your Atari produces sound.

For each sound channel there are a pair of registers that control the frequency, distortion and volume. These registers are called AUDFn and AUDCn, where n is the channel number. AUDF1 can be found at location $D200, with AUDC1 at $D201. The other three pairs follow after this. Along with these registers is an additional one called AUDCTL ($D208), which is the overall audio control register.

The AUDFn register controls the frequency of the note produced. The number N (those listed in the 8-bit column of table) stored here is used within a divide by N counter. Thus for every N pulses in there is one pulse out. It should be noted that the note produced is not the result of a sine wave but of a sequence of square pulses. With normal 4 channel 8-bit resolution the input frequency of this divide by N counter is 63921 Hertz. To determine the required value of N for each of the required frequencies the following formula is used:

$$N = \frac{31960.5}{Fout} - 1$$

Thus the correct value for middle C (C4) will be:

$$N = \frac{31960.5}{261.63} - 1 = 121.16$$

Of course this value cannot be used as only integers are allowed, thus giving us an in-built rounding error we cannot correct.

The AUDCn register is used to set the volume and distortion level for each channel. The register breakdown is shown in Figure 1.

The volume only mode is used to send the value specified by Volume level straight to the TV speaker without modulating it with the frequency. This causes the speaker to go in and out with the changing voltage (volume) and thus produce a sound. To turn the sound of you must set the volume to zero.

The distortion values are used to select a combination of poly counters whose outputs are ANDed with the pulses produced by the frequency divider (AUDFn). This randomly removes pulses, thus increasing the amount of distortion.

With all these values set to their required values a note is produced by following the following procedure:

1. Divide input frequency (63921 Hz for 8-bit channel) by the value stored within AUDFn.
2. Using the selected poly-counter filter the pulses produced by step 1.
3. Divide the resultant pulse wave by 2.

In order to produce better quality sound the Atari has the capability of combining the frequency registers to produce 16-bit dividers. Thus it is possible to have two 16-bit channels, one 16-bit and two 8-bit channels or four 8-bit channels. Sixteen bit dividers are produced by combining the following registers: AUDF1 with AUDF2 and AUDF3 with AUDF4. It is also necessary to increase the input frequency (63921 Hz does not provide the require output frequency range). All these changes are controlled by the register AUDCTL. The format of this register is shown in Figure 2.

To use 16-bit sound you first have to set the required bits within the AUDCTL register, these being bits 4 & 6 for 16-bit channel 1 and 3 & 5 for the second 16-bit channel. Next the value N has to be loaded into the frequency register pair, where AUDF2 and AUDF4 are the low bytes for each channel. The formula for determining the value N for 16-bit resolution is:

$$N = \frac{894885}{Fout} - 7$$

To control the volume of each of the 16-bit channels AUDC2 and AUDC4 are used.

In order to do this with Atari Basic you will have to write machine code routines to control the stored / music as the SOUND command only supports 6-bit resolution. With Turbo Basic the additional command OSOUNO provides the means to produce 16-bit music from within your program, thus removing the necessity of knowing about the above rules. The structure of the

`SOUND` command within Turbo Basic is as follows:

```
SOUND channel,frequency,distortion,volume
```

where:

- channel = 0 or 1
- frequency = 0 to 65535 (see Table 1 for values corresponding to music scale)
- distortion = 0 to 14 (even numbers only)
- volume = 0 (silence) to 15 (loudest)

As well as the increased frequency range over the standard statement it is also possible to turn off all sound channels by using just the command. For pure tones the distortion value should be set to 10.

That's it for this issue, sorry no typo in listing. The best way of learning is always to play so with the above table and some spare time convert those Basic tunes that sound slightly off and hear the improvements. If you have a good tune, written in Turbo Basic which uses the `SOUND` commands then send it in to 8/16 and we'll put together a PD disk full of music. If the tune is catchy we may even publish it.

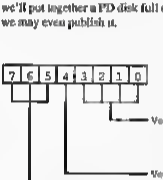


Figure 1 : Breakdown of AUDCn Register

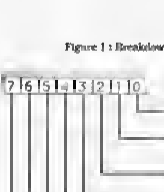


Figure 2 : Breakdown of AUDCTL Register

Note	Frequency	8 bit		
		Nominal Value	Frequency Produced	% Error
C1	32.70			
C#	34.65			
D	36.71			
D#	38.89			
E	41.20			
F	43.65			
F#	46.25			
G	49.00			
G#	51.91			
A	55.00			
A#	58.27			
B	61.74			
C2	65.41			
C#	69.30			
D	73.42			
D#	77.78			
E	82.41			
F	87.31			
F#	92.50			
G	98.00			
G#	103.83			
A	110.00			
A#	116.54			
B	123.47			
C3	130.81	243	130.99	+2.31
C#	138.59	230	138.36	-2.96
D	146.83	217	148.61	+2.67
D#	155.56	204	155.98	+3.68
E	164.81	193	164.74	-0.76
F	174.61	182	174.65	+0.38
F#	185.00	172	184.74	-2.50
G	196.00	162	196.08	+0.89
G#	207.66	153	207.54	-1.03
A	220.00	144	220.42	+3.21
A#	233.08	136	233.29	+1.52
B	246.94	128	247.76	+5.58
C4	261.63	121	261.97	+2.19
C#	277.18	114	277.92	+4.49
D	293.66	108	293.22	-2.67
D#	311.13	102	310.30	-4.75
E	329.63	96	329.49	-0.76
F	349.23	91	347.40	-9.34
F#	369.99	85	371.63	+7.45
G	392.00	81	389.76	-10.81
G#	415.30	76	415.07	-0.99
A	440.00	72	437.82	-8.63
A#	466.16	68	463.20	-11.31
B	493.88	64	491.70	-7.86
C5	523.25	60	523.94	+2.22
C#	554.37	57	551.04	-10.70
D	587.33	53	591.86	+12.97
D#	622.25	50	626.68	+11.87
E	659.26	47	665.84	+16.80
F	698.46	45	694.79	-9.36
F#	740.00	42	743.27	+7.43
G	783.99	40	779.52	-10.16
G#	830.61	37	841.07	+21.18
A	880.00	35	892.79	+14.86
A#	932.33	33	949.01	+13.85
B	987.77	31	998.77	+18.73

11-bit			Note	Frequency	8-bit			12-bit		
Nominal Value	Frequency Produced	% Error			Nominal Value	Frequency Produced	% Error	Nominal Value	Frequency Produced	% Error
27357	32.70		C6	1046.50	30	1030.98	-1.48	843	1048.46	+0.24
25821	34.65		C#	1108.73	28	1102.06	-0.60	800	1102.92	+0.29
24372	36.71		D	1174.71	26	1183.72	+0.77	755	1174.40	-0.05
23003	38.89		D#	1244.51	25	1229.25	-1.23	712	1244.64	+0.01
21712	41.20		E	1318.52	23	1331.69	+1.00	672	1317.98	-0.05
20493	43.65		F	1396.91	22	1378.50	-1.32	634	1396.46	-0.03
19342	46.25		F#	1479.98	21	1452.75	-1.84	598	1479.17	-0.05
18256	49.00		G	1567.98	19	1598.03	+1.92	564	1567.24	-0.05
17231	51.91		G#	1661.22	18	1672.13	+0.66	532	1660.20	-0.05
16264	55.00		A	1760.00	17	1775.56	+0.88	501	1761.60	+0.08
15351	58.27		A#	1864.66	16	1860.03	-0.25	473	1864.36	0.02
14489	61.73	-0.25	B	1975.54	15	1897.53	-3.95	446	1975.47	-0.05
13675	65.41		C7	2093.00	14	2135.79	+2.04	421	2093.88	+0.04
12907	69.30		C#	2217.46				397	2215.68	-0.08
12182	73.42		D	2349.40				374	2348.81	-0.05
11497	77.78		D#	2489.02				353	2485.82	-0.13
10852	82.41		E	2637.02				332	2632.81	+0.16
10243	87.31		F	2793.83				313	2785.55	+0.64
9668	92.50		F#	2959.96				295	2963.23	+0.11
9125	98.00		G	3135.96				278	3132.88	+0.10
8612	103.83		G#	3322.44				262	3326.75	+0.13
8128	110.01	+0.15	A	3520.00				247	3523.21	+0.09
7672	116.54		A#	3729.31				233	3728.73	-0.02
7241	123.47		B	3951.07				219	3959.71	+0.22
6834	130.81		C8	4186.01				207	4181.75	-0.10
6450	138.59		C#	4434.92				195	4430.17	-0.11
6088	146.82	-0.12	D	4698.64				183	4709.97	+0.24
5746	155.55	-0.11	D#	4978.03				173	4971.64	-0.13
5423	164.81		E	5274.04				163	5264.09	-0.19
5118	174.61		F	5587.65				155	5593.09	0.04
4830	185.01	+0.09	F#	5919.91				144	5926.45	0.06
4559	195.99	-0.02	G	6271.93				136	6258.01	-0.15
4303	207.83	-0.26	G#	6644.88				128	6628.85	-0.20
4061	220.58	-0.14	A	7040.00				120	7046.42	+0.05
3832	233.11	+0.22	A#	7458.62				113	7457.46	-0.01
3617	246.74		B	7902.13				106	7917.42	0.19
3414	261.60	-0.20	C9	8372.02				100	8363.50	-0.10
3222	277.14	-0.26	C#	8869.84				94	8850.35	-0.21
3040	293.70	+0.23	D	9397.27				88	9419.95	+0.24
2869	311.16	+0.16	D#	9956.06				83	9943.28	-0.13
2708	329.61	-0.11	E	10548.08				78	10559.19	+0.11
2555	349.30	+0.34	F	11175.30				73	11186.19	+0.10
2412	369.94	0.24	F#	11839.82				69	11774.95	-0.76
2276	391.98	-0.09	G	12543.85				64	12604.15	+0.08
2148	415.26	0.17	G#	13289.75				60	13356.64	+0.46
2027	439.97	-0.12	A	14080.00				57	13982.73	-12.31
1915	466.09	0.27	A#	14917.24				53	14914.92	-0.28
1805	493.87	0.04	B	15804.27				50	15699.91	-11.77
1703	525.35	+0.26	C10	16744.04				46	16884.81	+14.13
1607	554.46	+0.27	C#	17740.00				43	17897.90	+14.97
1517	587.20	0.39	D	18794.55				41	18643.65	-14.31
1431	622.32	+0.19	D#	19912.13				38	19886.56	-2.29
1350	659.47	+0.54	E	21096.16				35	21307.03	+16.81
1274	698.59	+0.31	F	22350.61				33	22372.38	+1.64
1202	740.19	+0.43	F#	23679.64				31	23549.87	-9.76
1134	784.31	+0.69	G	25087.71				29	24858.19	-16.30
1070	830.91	+0.61	G#	26579.50				27	26320.44	-17.37
1010	879.94	-0.12	A	28160.00				25	27965.47	-12.31
953	932.10	0.29	A#	29834.48				23	29829.83	-0.28
899	987.74	-0.05	B	31608.53				21	31960.54	+18.75

The Free To Advertise Survey

I've always wanted to be able to advertise **8:16** in the computer press. The mentions we have had so far have been very useful, especially the User Group list in Page 6, but to advertise, would, I believe bring us more possible readers and members for our group. But how much does it cost to advertise? I've always assumed that it was prohibitive without our finding out. As well as this, small software companies (and individual developers) who want to sell their software (or hardware) have to advertise. The cost of the advertisement is covered within the price of the product, but by how much. So here it is! The Free To Advertise.

The following table lists the cost for different size adverts (measured in page area) against each of the computer magazines surveyed. Also listed in each magazines circulation figure. The figure under each of the entries is a measurement of that particular adverts value and is based upon the following formula :-

Circulation * Advert size
Cost of advert.

eg. for an eight page mono advert with ACE the value is calculated by (70000 * 1/8)/140 = 62.5

Of the magazines that gave me their rates, some also sent me their advertisement promotion packages. Just to show how varied and interesting these packages were I'll describe them for you :-

ATARI ST USER

This package consists of a folder with the magazine logo on front with the slogan *Opening up the world of ST computing*. On opening the folder you will find four removable sheets. The first sheet contains the circulation figures. The other three sheets are entitled *Rate Card*, *The Market* and *The Magazine*. The rate card is A4 and located at the back. The other two sheets are 2" and 4" shorter. The three sheets are visually connected by the magazine logo being printed on the top half of the A4 sheet and thus crossing the edge of the other two sheets. Upon reading the Magazine Sheet you soon realise that the package was put together when ATARI ST User was launched as a separate magazine, after it's short stay with Atari User.

COMPUTER & VIDEO GAMES (C+VG)

Of all the packages this is my favourite. It consists of a A3 piece of card folded to A4 with a baby lion playing with toilet paper (just like the andrex ad on TV) on the front page. On the centre page there is a full grown lion wish toilet paw around the C+VG logo, while the back page details the rates. As with all these packages there is a slogan, this one being *None out of ten Software houses say they prefer it...* <turn over to centre page> *...because no games player dare turn his back on it..* A second slogan is also used starting on the middle pages and ending on the back - *9 out of 10 companies are flushed with success and as for the tenth....* <turn over to centre page>, *...it's just been flushed!* The second half of this saying is accompanied by a picture of the baby lion being flushed down the toilet - poor thing! one nice touch is the graph of circulation figures against years, showing how C+VG has increased its circulation from about 25,000 in 1981 to its current figure of 106,093

PAGE 6

The Page 6 package is fronted with the slogan *Free years in the making*

A new magazine for ATARI Users. Inside the package you get a list of copy dates for future issues, the rate card, a request for review material (software and hardware), details about the magazine

	Mono					Colour				
Magazine	1/8	1/4	1/2	1	2	1/4	1/2	1	2	Circulation
ACE	£140 62.5	£275 63.6	£525 66.7	£995 70.4				£1295 54.1		70 000
Atari ST User	£75 68.3	£120 85.4	£220 93.2	£400 102.5	£780 105.1		£300 68.3	£590 60.5	£1150 71.3	41,000 (31,000UK)
Atari User	£75 53.3	£120 66.7	£220 72.7	£400 80.0	£780 82.1		£300 53.3	£590 54.2	£1150 55.7	32 000
Computer + Video Games	£170 78.0	£320 82.6	£550 96.4	£1000 106.1	£2000 106.1			£1495 71.0	£2990 71.0	106,093
Moniter	£15 37.5	£30 37.5	£60 37.5	£120 37.5						4 500
Page 6	£60 82.1	£100 62.5	£185 67.6	£350 71.4	£625 60.0			£495 50.5	£875 57.1	25 000
Popular Computer Weekly		£165 82.5	£300 66.7	£575 60.6	£1150 60.6			£995 44.7	£1790 44.9	40 000 (per week)
Personnel Computer World		£500 37.5	£920 40.8	£1670 45.0				£2270 33.0		75,023
Program Now		£208 42.1	£305 57.4	£595 50.4		£508 17.2	£805 28.9	£995 33.2		35,000
ST World		£120 52.1	£220 56.8	£400 62.5	£780 64.1		£300 41.7	£590 42.4	£1150 43.5	25,000

The Programs

The programs within this issue of 8 16 are written in Turbo Basic The following listing conventions are used

1) Underlined characters should be typed in inverse video
2) The use of <CNTL> preceding any character indicates that the Control key and character key should be pressed together

Subscriptions

8 16 can be supplied on a regular basis at a [illegible] clearly state your name and address and the issue number the subscription is to commence with.

Subscription Offer

To encourage the use of Turbo Basic 8 16 are offering a free disk to all new 8-bit subscribers The disk contains Turbo Basic (interpreter + compiler) DOS 2 5 (including all the support modules) and some additional Turbo Basic programs If you want the disk lets us know when you subscribe

Commercial Advertisement

Rate - £10 ..... Full page
£5 ..... Half page

Contact Colin (0202 - 677895 evenings) for [illegible]

and a complimentary issue (the issue with my package was 32 - the current issue when the package was requested) You also get a picture of Nicola Parry answering the phone! One thing that was missing was circulation details though this was probably due to the fact that Page 6 had just appeared on the newsstand and the figures were not yet available. Anyway, a quick phone call soon solved this. Once again, as ATARI ST USER this package was produced for a particle occurances - in this case the newsstand launch

PERSONNEL COMPUTER WORLD - PCW

This is the best package of all those I received. It is presented as a lawyer's case document with the slogan *An open and shut case* Upon breaking the seal and opening each of the flaps you are presented with a copy of PCW in the centre, the rate card on the left and the evidence file on the right. The rate card and evidence file are both 1/2 width A4. Within the evidence file are sections titled *Circulation Readership Editorial, Market Place and The Verdict* As each title suggest, each section of the evidence file tries to sell PCW to the prospective advertiser Within the readership section they inform you that the readership extends to 200,000 with statistics on the sex of the reader his/her job and the size of the company he/she works for The editorial section list all the 'firsts' including Atari's PC The market place section details the spending power of their business readers, while the verdict section quotes extracts from satisfied advertisers Looking at the rate of PCW and the number of adverts in every issue it is quite easy to believe that advertising in PCW means sells.

CONCLUSION

On drawing conclusion for this article it is very easy to say *which magazine gives me best value for money?* It is also very easy to answer the question C+VG But both the question and the answer are to simple. Firstly if you are selling Atari 8-bit products you are most certainly better off advertising within Atari Users Page 6 or Monitor Whereas if you are selling ST products Atari ST User Page 6 and ST World would be the obvious choices If however you are selling products for both ranges of computer Page 6 and Monitor would be better choices. You may even consider ACE C+VG and PCW depending upon your other products, the computers supported and the type of products you are trying to sell.

All in all, the conclusion for this type of article is that there isn t one..though some sound advice can be given. When you get to the stage where advertising is required you must first decide upon the amount of advertising required and where Its no good placing adverts for an Atari 8 bit game in PCW or a new UNIX based C Compiler in Page 6 you wont get enough returns It is probably better to place your initial adverts as eigth or quarter page slots within Monitor OK the circulation is low but so is the initial outlay only £15 or £30 instead of about £60 or £120 If you have a product that has had rave reviews and great expectations you will have to advertise in the bigger magazines A good example of this is STAC from Inventive Software who even took out a stand at the last Atari User Show for this one product. Whatever your product is there is one golden rule do not advertise something you do not have. The best way to get a bad reputation is to advertise a product several months before its completed, take orders for it and then sit on the money waiting

When your product is fully developed, tested and ready for release carefully assess the market, determine the magazine that gives you the biggest possible user coverage and start your advertisement campaign there. You should also remember the free advertisement obtained by sending review copies to all the relevent magazines (and newsletters)

Turbo Basic de-Tokeniser

In the last issue of 8:16 we looked at the way basic programs are stored. Within this issue is an enhanced version of the De-tokeniser program original published in Monitor. This enhanced version supports all the Turbo Basic commands while still being compatible with normal Atari Basic programs.

The program is split into several different sections and is very easy to run. In order to maximise the amount of free space the only error checking is done when reading the source file. Make sure you have entered the filenames correctly and that there is enough spare space on the destination disk.

One feature of the Monitor version of de-tokeniser has been removed, that is the ability to read files from cassette. As Turbo Basic is a disk based language the number of users saving files to cassette will be minimal and thus, in my opinion, less important than the additional storage space removal of the code provides.

After the program has completed you will have to clear memory using the NEW command and ENTER the listed file in-order to save the program back as a BASIC tokenised program.

Sorry, no program breakdown this time, but if anyone has any problems understanding any of the routines, please feel free to give me a ring.

Colin Hunt

```
100 DIM F1$(15),F2$(15),CMD$(500),OPR$(300
),AS(22)=AS(10) VAR$(800)
110 DIM OPTS(9)=DS(256),CMD(100,41) OPR(11
0,41),VAR(256 41)
120 POKE 82,0:CLS :? "    DE-TOKENISER..  ...By
 Tom Levy"
130 ? "   Turbo Basic Version By Colin Hunt":? "
":FOR X=1 TO 35:? "-";:NEXT I:?
140 FOR I=40 TO 100
150 READ AS:A=LEN(AS):L=LEN(CMD$)+1
160 CMD(I,40)=L:CMD(I,41)=L+A-1:CMD$(L,L+A)=AS
170 NEXT I
180 ? "Commands  " CMD-2
190 FOR I=10 TO 109
200 IF I=18 OR I=60:AS="",":ELSE :READ AS ENDIF
210 A=LEN(AS) L=LEN(OPR$)+1
220 OPR(I,40)=L:OPR(I,41)=L+A-1:OPR$(L,L+A)=AS
230 NEXT I
240 ? "Operators: ";OPR$:?
250 VNT=DPEEK(130):VNTD=DPEEK(132):VVTP
=DPEEK(134)
260 FOR I=VNTP TO VNTD
270 A=PEEK(I):C=C+A
280 IF A=255 AND C=41 THEN 320
290 IF A>127 THEN V=V+1:C=40
300 NEXT I
310 ? "SYSTEM ERROR ....":? " Variable H Cannot Be
Located (!!!":STOP
320 POP :BLOC=VVTP+V*8+1
330 --
340 REM >Open the files
350 INPUT "INPUT file....";F1$:? F1$
360 OPEN #41,4,0,F1$
370 INPUT "OUTPUT file   " F2$:? F2$
380 IF F2$<>"" THEN OPEN #42,8 0,F2$
390 --
400 REM >Get input file header
410 EXEC GET_B_BYTE:LOMEM=D_BYTE
420 EXEC GET_B_BYTE:VNTP=D_BYTE
430 EXEC GET_B_BYTE:VNTD=D_BYTE
440 EXEC GET_B_BYTE:VVTP=D_BYTE
450 EXEC GET_B_BYTE:STMTAB=D_BYTE
460 EXEC GET_B_BYTE:STMCUR=D_BYTE
470 EXEC GET_B_BYTE:STARP=D_BYTE
480 ? "LOMEM  = ";LOMEM,"VVTP  =";VVTP
490 ? "VNTP   = ";VNTP  ="=";VNTD
500 ? "STMTAB = ";STMTAB "STARP =",STARP
510 --
520 REM >Get variable name table
530 USV=40:POKE 766,41
540 VAR_SIZE=VNTD-VNTP+41
550 BGET #41,ADR(VARS),VAR_SIZE
560 VARS(VAR_SIZE)="<CNTL>("
570 ? ,? "Existing variable name table: ",VAR$ ?
580 INPUT "Use Existing VARIABLE NAMES (Y/N)  "
,OPTS
590 IF OPTS="Y":USV=41:ELSE :VAR$=""*ENDIF
600 --
610 REM >Get variable data
620 C=40:VN=40:VN1=40 VA=40 VA1=40 VS=40 VS1=40
630 FOR I=VVTP TO STMTAB-41
640 C=C+41:IF C>0 THEN C=41
650 GET #41,X
660 IF USV<>41 AND C=41
670 IF X=40 OR (X>191 AND X<105)
680 VN=VN+41 IF VN>28 THEN VN1=VN1+41:VN=41
690 NS=CHR$(VN+64):IF VN1<>40 THEN NS(2,
2)=CHR$(VN1+17H)
700 IF VN1=40 THEN NS=CHR$(VN+102(
710 ELSE
720 IF X>66
730 VS=VS+41 IF VS>26 THEN VS1=VS1+41:VS=41
740 NS=CHR$(VS1+64):IF VS1<>40 THEN NS(2,
2)=CHR$(VN1+40):69(3,3)=CHR$(164)
750 IF VS1=40 THEN NS(2,2)=CHR$(168)
760 ELSE
770 VA=VA+41 IF VA>26 THEN VA1=VA1+41:VA=41
780 NS=CHR$(VA1+64):IF VA1<>40 THEN NS(2,
2)=CHR$(VA1+48):NS(3,3)=CHR$(168)
790 IF VA1=40 THEN NS(2,2)=CHR$(168)
800 ENDIF
810 ENDIF
820 L=LEN(VAR$)+1:VAR$(L,L+LEN(NS))=NS
830 ENDIF
840 NEXT I
850 IF USV=40 THEN ? :? "New variable name
 table  ";VAR$:?
860 --
870 REM >Create V-Name pointer array
880 N1=41 C=40
890 FOR I=41 TO LEN(VAR$)
900 A=ASC(VAR$(I,I))
910 IF A>128
920 VAR(C,N1)=N1 VAR(C,41)=I:N1=I+41
930 C=C+41:VAR$(I,I)=CHR$(A-128)
940 ENDIF
```

```
950 NEXT I
960 TRAP 1920
970 --
980 REM >Get token line
990 DO
1000 EXEC GET_D_BYTE
1010 D$=STR$(D_BYTE):EXEC OUTPUT.D$=" ": EXEC
OUTPUT
1020 GET #%1,LO
1030 DO
1040 GET #%1,SO-GET #%1,X
1050 IF X=84
1060 D$="~",D$(%3)=CHR$(155):EXEC OUTPUT:EXIT
1070 ELSE
1080 IF X=80 OR X=61
1090 D$=CND$(CMD(X,80),CMD(X,61)):EXEC
OUTPUT:EXEC GET_NUM:EXEC OUTPUT:EXIT
1100 ELSE
1110 IF X=54:D$="" ELSE  D$=CMD$(CMD
(X,80):CMD(X,61)) ENDIF
1120 EXEC OUTPUT
1130 DO
1140 GET #%1 X
1150 IF X=22 THEN D$=CHR$(155):EXIT
1160 IF X=20 THEN D$=" ":EXIT
1170 IF X=27 THEN D$=" THEN "":EXIT
1180 IF X<>56 AND X<>57
1190 IF X=80
1200 GET #%1,X:X=X+128:D$=VAR$(VAR(X,80),VAR(
X,81))
1210 ELSE
1220 IF X=13
1230 D$="$":EXEC GET_NUM:D$(%2)=HEX$(N)
1240 ELSE
1250 IF X=14
1260 EXEC GET_NUM:D$=STR$(N)
1270 ELSE
1280 IF X=15
1290 EXEC GET_STRING
1300 ELSE
1310 IF X>127
1320 X=X-128 D$=VAR$(VAR(X,80),VAR(X,81))
1330 ELSE
1340 D$=CHR$(CHR(X,80),CHR(X,81))
1350 ENDIF
1360 ENDIF
1370 ENDIF
1380 ENDIF
1390 ENDIF
1400 EXEC OUTPUT
1410 ENDIF
1420 LOOP
1430 EXEC OUTPUT
1440 ENDIF
1450 ENDIF
1460 IF X=22 THEN EXIT
1470 LOOP
1480 LOOP
1490 --
1500 REM >Get number constant
1510 PROC GET_NUM
1520 FOR N1=81 TO 8
1530 GET #%1,X:POKE N1+MLOC,X
1540 NEXT N1
1550 ENDPROC
1560 --
1570 REM >Get string constant
1580 PROC GET_STRING
1590 D$=CHR$(34):GET #%1,X
1600 IF X=80
1610 N1=82
1620 ELSE
1630 FOR N1=82 TO X+81
1640 GET #%1,X:D$(N1,N1)=CHR$(X)
1650 NEXT N1
1660 ENDIF
1670 D$(N1,N1)=CHR$(34)
1680 ENDPROC
1690 --
1700 REM >Get REM command
1710 PROC GET_REM
1720 N1=81:D$=""
1730 REPEAT
1740 GET #%1,X:D$(N1,N1)=CHR$(X)
1750 N1=N1+%1
1760 UNTIL X=155
1770 ENDPROC
1780 --
1790 REM >Output routine
1800 PROC OUTPUT
1810 IF D$<>""
1820 ? D$
1830 IF PZ$<>"" THEN ? #%2;D$,
1840 ENDIF
1850 ENDPROC
1860 --
1870 REM >Get double byte routine
1880 PROC GET_D_BYTE
1890 GET #%1,X GET #%1,Y:D_BYTE=X+256*Y
1900 ENDPROC
1910 --
1920 REM >End of file trap
1930 CLOSE #POKE 82,2:POT 253
1940 ? "~~~~~~~~~~~~~~~~~~~~ Compleete ~~~~~~~~~~~~~~~~~~~~"
1950 END
1960 --
1970 DATA REM ,DATA ,INPUT,COLOR ,LIST ,ENTER ,LET ,IF
,FOR NEXT ,GOTO GO TO GOSUB ,TRAP ,BYE,CONT
1980 DATA COM,CLOSE,CLR,DEG,DIM,END,NEW,OPEN,LOAD,SAVE,
STATUS,NOTE,POINT,XIO,ON,POKE,PRINT ,RAD
1990 DATA READ,RESTORE ,RETURN,RUN,STOP,POP,?,GET,PUT,
GRAPHICS,PLOT,POSITION,DOS
2560 DATA DRAWTO,SETCOLOR,LOCATE,SOUND,LPRINT, CSAVE,
CLOAD, ,ERROR-,DPOKE,MOVE,-MOVE,^F
2610 DATA REPEAT, UNTIL, WHILE,WEND,ELSE,ENDIF,PUT,GET,
FILLTO
2020 DATA DO,LOOP,EXIT-DIR,LOCK, UNLOCK,RENAME, DELETE,
PAUSE TIME$- PROC,ENDPROC,PCOLOR
2030 DATA ^L -,RENUM, DEL,DUMP TRACE TEXT,SLOAD- BRUN,
GO6,@,^B,PAINT,CLS,SOUND,CIRCLE-&PUT, &GET
2040 --
2050 DATA $,!,:,, GOTO, GOSUB  TO, STEP THEN ,@,<=,
<>,>=,<,>,=, ,+,+,-,/,NOT, OR, AND, (,),-,=,<=,<>,>=,<
2060 DATA >=,+,-, (, (, (, (
2070 DATA STR$ CHR$,USR,ASC,VAL,LEN ADR,ATN COS,PEEK
SIN,RND,FRE,EXP,LOG,CLOG,SQR,SGN,ABS,INT,PADDLE
2080 DATA STICK STRIG,PTRIG, &,1,INSTR,INKEY$ EXOR,NOT$,
DEC HIV,FRAC-TIME$,TIME MOD  EXEC-FND-RAND
2090 DATA TRUNC$ 40,41,42,43 GOS OINSTR ERR,ERL
```

Written a good program? Then we would like to hear from you.

Atari Show Reports

Once again I've asked the members of the BaPAUG to provide the reviews for the recent Atari User Show held at the Alexandra Palace I would therefore like to thank both Ian and Thomas for their thoughts about the show I would also like to thank Ken Ward and Database Exhibitions for making it possible for us to be there

The show was held at the Alexandria Palace for the first time to cope with the demand for floor space required by so many exhibitors and I must admit that there are advantages and disadvantages to this, but more of this later

If you have never been to the palace before then I suggest that you do so if ever the chance arises as it is truly wonderful place to behold and a marvellous setting for the show, but although all the floor space was taken up and the hall was crowded I felt that the place did not have the atmosphere of previous venues

The show itself was again good and I enjoyed my day there greatly The User Group stand was larger the time round although we still filled our own allotted area to bursting We were also in a better position and hence received a lot of attention Demand for 8/16 and our own home grown PD software was beyond expectations, again

The crowds this time consisted solely of ST's queuing the very latest software such as I Ball, Barbarian, Terrapods etc and was always full of happy people Software was everywhere as usual, although I didn't think that there were any real bargains this time, fair reductions yes, real bargains no All the latest releases were available including Time and Magik, which was selling extremely well Nobody could have missed Official Secrets, a load of adventure club offering discounted games, free membership at the show and all the help you could possibly need when you start to pull your hair out – look out for them

Anyway, another successful show for the Atari machine, whose support just keeps growing

Ian Brooker

Show Dates

Shows that may interest Atari Users. Check with organiser's for entry fees and conditions

The Personnel Computer Show
14-18 September 1988
Earls Court, London
Montbuild (01) 486 1851

The Atari User Show has moved to a bigger location the Alexandra Palace in London We as an Atari User Group were invited again That's what I like about being in a user group Anyway, the Alexandra Palace looked very big and impressive from the outside but very run down as well But don't judge a book by its cover, as they say in Germany Stepping inside, there was a nice sitting area You plonk yourself down and relax or just watch the girls passing by or just order some food and drink But I think we didn't come here for that!

So, bypassing all the waiting people to get in, we find ourselves inside the show, fighting our way through the crowd to the User Group stand. My first duty was to go around and check out the difference between this and the old place This is where Alexandra Palace scored full marks, because everything was on one floor and not seperated on two floors like the Novotel at Hammersmith.

Some companies didn't show up. For example Red Rat and 2-Bit Systems, which was a little disappointing, but as I found out later, both companies were reorganising themselves Red Rat / Atari World have got their act together and have produced a nice little catalog covering the VCS, 8-bit and 16-bit software / hardware Well done you guys from Manchester - how about sticking it on the next cover of Atari User and Page 6 Atari wasn't there, but we know that and nobody missed them Oops, I shouldn't really be writing this

Anyway, it was all go, the stands were always busy, the people wandering around, enjoying themselves playing games in the arcade area, asking questions at the user group stand or just buying ST's, XE's or whatever

I finally brought myself a disk-notcher, very useful little gadget indeed No more blood-stained disks trying to use a razorblade I also found plenty of old Atari software which is in my opinion the better software if you compare it with nowadays This is, of course, not always true Mandarin Software have produced the fabulous Time And Magik trilogy but then again this is three old adventures thrown together and packed into one box Tynesoft a company I'm beginning to like more and more have produced Olympiad '88 a great game with great graphics and Four Great Games 3, the best compilation so far Hang in there Tynesoft I buy all your products

Finally, new VCS games, Summer Games, Winter Games, California Games, Activision Games, everything was there and plenty to choose from

So, all in all, it was a very good show and I hope to see you all again at the PCW or the next Atari Show

Thomas Holzer

Desktop Publishing Show
13-15 October 1988
Business Design Centre
Database Exhibitions (0625) 878888

The Atari User Christmas Show
25 27 November 1988
Alexandra Palace, London
Database Exhibitions (0625) 878888

Dungeons and Dragons

Welcome to the world of Dungeons and Dragons, or if you you prefer Fantasy Role Playing. Ok lets start at the beginning, what is Fantasy Role Playing? To put it simply: letting your imagination run wild and why not? Dungeons and Dragons is just one section of Fantasy Role Playing, like for instance War Gaming.

The game itself does not require a playing board, although often a map will be used to give a visual description of the land in which your adventure is to take place.

The game is controlled by the Dungeon Master who should be an experienced D+D player. The DM can either use scenarios which are purpose written, or alternatively, devise his own. The DM controls his own characters or monsters which are generally known as Non-Player Characters, NPC'S.

The players create their own characters using special dice; the dice can range from 3 sided to 100 sided.

Each and every character have 7 basic attributes, these are:-

Strength,	Dexterity,
Wisdom,	Intelligence,
Constitution,	Charisma,
Armour/Class,	Hit/Points.

Once you have these basic attributes you can then begin to build your character you must try to decide what is best for your character and dungeon party, for example a Fighter would need a high figure of strength and dexterity for fighting, or another example, a Magic User would need to be intelligent and wise.

Once the players are happy with their characters, the Dungeon Mastermay well equip the party with weapons and magical items of his own choosing

The adventure is now about to begin and the Dungeon Master now explains the scenario to the players (usually spotting an evil group and the players. When the fight is over, the players

This is a very bare description of the game, but please do not be put off by the games apparent complexity, try to contact a local dungeon group in your area, or please write to the 8;16 club and we will endeavour to find a group for you.

PS. Anybody in the Bournemouth and Poole area interested in playing Dungeons and Dragons please contact me on (0202) 37659 and ask for Neil.

The Atari ST and Robots

Atari are to market **Personnel Robots Robokit** for the Atari ST for £79.95. For your money you get a PCB that plugs into the cartridge port and a 360K disk of software. In order to use the kit you do have to buy at least £40s worth of Lego. This is not the normal brick Lego but the Technical and Educational Sets that come with stepper motors etc. Kits that are recommended are the 1032 Basic Technical Set and the 1090 Educational Control Set. You can also use Fischer - Technik systems or your own home brewed system if you don't want to use the LEGO kits.

The software supplied is the same as that supplied with the more expensive Robokit. The hardware supplied provides 16 channels – 8 input and 8 output. The output channels can be used for power or as logic. There is also a baud boarding area.

All to all, this is a brave move by both Atari and Personnel Robots which should help establish the Atari ST within the educational establishments while at the same time give those users at home, who are interested in Robots, a chance to experiment at home.

Maplin Electronic Supplies Ltd. sell a robot kit called the **Remote Control Programmable Robot Kit** which via a RS232 interface can be controlled by almost any computer, including the Atari ST, with the appropriate software. The kit comes with all the electronics pre-assembled. Also provided is a remote controller a detailed 32-page handbook, an assembly manual, programming details and the screwdriver required for assembly.

The robot is about 230mm high and travels around on a set of wheels controlled by one of its motors. When being controlled the movement is somewhat hindered by the RS232 cable.

Of interest to younger children is that a crayon can be fixed to its base which will draw as the robot moves.

Movement commands include move forward/backwards, turn left/right, curve left/right ,stop movement and repeat previous movement. Other commands include start a program, turn headlights on/off, erase memory, play or compose music, dance and set in low/high gear

In order to use the robot all programs must be home grown. Instruction are included which show you all you need to do this, along with examples written in BASIC.

The Maplin robot cost £39.95 and though not as sophisticated as Robokit it is still good value for money

Maplin can be contacted at P.O Box 3, Rayleigh, Essex SS6 2BR or by telephone on 0702 554161. The order for the robot kit is XJ06G. For more information about Robokit contact Atari on 0753 33344

Olds is a mixture of Thrust, Guardian, and Choplifter. The plot is quite emotional and the idea is that there are two races, the Biocretes, and the Olds. The Olds are used by the Biocretes as slaves. The Biocretes abuse the Olds and let them work without oil. When an Old can work no longer, it is scrapped and another is built. Your mission is to rescue the Olds.

You take control of a V-wing fighter equipped with nuclear pellets (bullets to the gamester), and nevabombs. With the assistance of a re-chargeable shield and fuel depots dotted around what could be easier?

When the game is loading you are presented with quite an impressive animated title page. Once it has loaded you can select which galaxy you will defend. There are a few galaxies which contain planetoids of varying difficulty. You are advised to start on the easiest (Novelds) to get used to the controls.

The game can be played from either keyboard or joystick, the latter being the easier option. You can re-define the keyboard should you wish which should be a feature in more games! Your V-wing fighter resembles the craft in the eight bit game Asteroids. Your craft has only rear thrust which makes tight manoeuvres difficult. Left and right are rotate left and right respectfully, back is shield, and forwards is thrust. The fire button if held down will release a nevabomb (only four per life).

Once into the game, you see a barren landscape with some installations dotted around. The installations are of different categories, namely being decoration, friendlies, and defence. Decoration are things such as trees, bushes, and little buildings which can all be shot. Friendlies are refueling depots, and Old prisons, whilst Defence throw everything at you from fighter planes to heat-seeking missiles.

The objective of the game as explained earlier is to rescue the Olds, this is achieved by firing one bullet and destroying the prison and leaving the Olds running around. You must take care not to shoot any Olds! You then land and they will climb into your ship, collect eight and you must return them to your mother ship.

You have fuel which is used with thrusting, and shield. You can press the space bar at any time to convert some fuel into shield. If you find yourself replenishing your shield a lot you will need a fuel depot. Land within pipeline distance and you will be refueled.

If you tire of the screens you can try you hand at designing your own with the editor which is extremely easy to use. You can even get your mates to design screens for each other. The new screens can be stored on the game disk and now become a part of the proper game! I had great fun shooting the Olds as they were trying to dodge my fire and waving their arms! Olds is a terrific game and I can't stop playing it, and you can spend just as long and have just as much fun designing devious games yourself.

Product Update

Since the last issue of 8:16 we have received several press releases from various companies. To these companies - Thank You.

Third Coast Technologies are a recent addition to the **Metrom Group of Companies** and have been formed specifically to manufacture and distribute hard drives for the Atari ST.

The drives available, along with their costs (excluding VAT) are:

25MB (un-formatted) / 21MB (formatted)	£399.00
40MB (un-formatted) / 35MB (formatted)	£499.00
50MB (un-formatted) / 45MB (formatted)	£599.00
64MB (formatted)	£899.00
124MB (formatted)	£1499.00

All are 5.25 inch hard drives housed in a 13 * 8 * 4.5 inch cabinet, including an air fan. All are shipped fully formatted and ready for use. For more details contact Jason N Millar on (0257) 426464..

On the 13th of June **Frontier Software** announced price reductions on the Supra range of hard drives for the ST. The new retail prices (including VAT) are -

SupraDrive	20MB	£549.95
	30MB	£699.95
	60MB	£999.95
	195MB	£3299.95
MegaDrive	40MB	£849.95

Frontier have also announced the availability of a new SuperDrive - a 120MB version, costing £1699.95. Frontier Software can be contacted at P.O. Box 113, Harrogate, North Yorkshire, HG2 0BE.

Page 6 have a new product called TariTalk which allows you to transfer files between your 8-bit Atari and you ST. See the review within this issue of 8:16.

User Group File

Looking for your local User Group? Then check out the map opposite to find the nearest group and give its contact a call

If you would like your User Group to be included within our User Group file, please send the following information to 8:16 (address on page 2)

The groups name.
The contacts name, address and telephone number
Meeting place (if any) and dates of meeting (eg. 1st Friday each month).
Name of Newsletter and release months.
Special interests within the group,
and finally a copy of the map, with a mark showing to where you live.

Future issues of 8:16 will list the information supplied by each group
The map will be used to indicate where the groups are situated.

Name : Birmingham User Group
Contact : Will Coton
31 Barn Meadow Yardley Birmingham, B25 8YT
Notes : XL-ST. Meetings, BBS

Name : Bournemouth & Poole Atari User Group (BaPAUG)
Contact : Colin Hunt 0202 677895
248 Wimborne Road, Oakdale, Poole, Dorset.
Meetings : 1st Friday every month at the Kinson Community Centre, Pelhams, Millhams Lane, Kinson.
Newsletter : 8 16

Name : Cardiff Area ST User Group
Contact : Alan Griffiths
48 Charles Street, Cardiff, CF1 4EF
Notes : ST. Meetings

Name : Fast ST Basic Users Group
Contact : Simon Rush
42 York Road, Rayleigh, Essex SS6 8SB
Notes : ST, Newsletter

Name : HMS Drake's Computer Club
Contact : John Godfrey
Education Centre, HMS Drake, Plymouth, Devon
Notes : XL-ST Others, Meetings

Name : John Player Computer Club
Contact : Robin Smith
7 Trafalgar Road, Beeston Rylands, Notts., NG9 1LB
Notes : XL-ST-Others, Meetings

Name : Lea Valley Atari User Group
Contact : Matt Tydeman
125 Cadmore Lane, Cheshunt, Waltham Cross, Herts
Notes : XL-ST. Meetings-Newsletter

Name : London Atari Computer Enthusiast (LACE)
Contact : Glenn Leader
143 Richmond Road, Leytonstone, London E11 4BT

Name : Merseyside Atari Club
Contact : Ken Hall
84 Fairoy Way, Liverpool L6 1JS
Notes : ST, Meetings, Newsletter & BBS

Name : Norwich User Group
Contact : Ken Ward 0603 661149
45 Colekram Road, Lakenham, Norwich NR1 2NZ
Meetings : 1st Sunday every month. Contact Ken for time and place.
Newsletter : NUGGET

Name : Slough Atari Users Club
Contact : Colin Corne
3 Wattley Close, Stoke Poges, Bucks. SL3 6NS
Notes : XL-ST Meetings

Name : Special Interest Group Atari (SIGATARI)
Contact : Glenn Leader
143 Richmond Road, Leytonstone, London E11 4BT
Newsletter : SIG NEWS

Name : South West ST User Group
Contact : Karl Fuller
289 Fort Austin Avenue, Crownhill, Plymouth, PL6 5ST
Notes : ST, Meetings, Newsletter

Name : ST London User Group
Contact : Marvey Mills
7A Ambleside Drive, Southend On Sea, Essex
Notes : ST Meetings, Newsletter & BBS

Name : Thames Atari Users
Contact : Anthony Cox
48 Silk Hall Gardens, Chiswick, London, W4 3BU
Notes : XL-ST Meetings

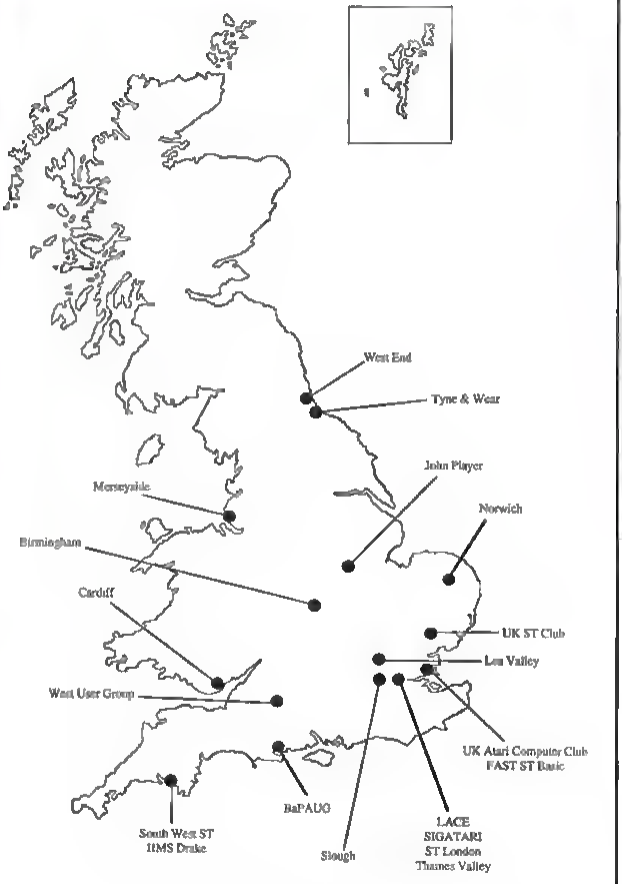
Name : Tyne & Wear Atari User Group
Contact : F Gregory
20 Maple Avenue, Silkwood, Sunderland SR3 1QW
Notes : XL-ST, Meetings, Newsletter

Name : The UK Atari Computer Club
Contact : Roy Smith
PO Box 3, Rayleigh, Essex SS6 7LR
Newsletter : Monitor
Notes : XL-ST

Name : UK ST Club
Contact : Tony Gosling
Swans Nest, Wenmefield, Ipswich, IP6 9AJ
Notes : ST Newsletter

Name : West End Atari User Group
Contact : John Chadwick
208 Joan Street, Byker Newcastle-Upon-Tyne
Notes : XL-ST, Meetings

Name : West User Group
Contact : Stewart Renfrew
c/o Trowbridge Computer Shack, Castle Street, Trowbridge, Wilts. BA14 8AS
Notes : ST, Meetings, Newsletter


West End
Tyne & Wear
John Player
Norwich
Merseyside
Birmingham
Cardiff
UK ST Club
Lea Valley
West User Group
UK Atari Computer Club
FAST ST Basic
BaPAUG
LACE
SIGATARI
ST London
Thames Valley
South West ST
HMS Drake
Slough

CHRISTMAS JUST WOULDN'T BE CHRISTMAS WITHOUT THE

ATARI USER SHOW

Too early to think about Christmas? Not when it comes to the Atari User Show.

For this is the festive event that has it all.

LOADSA exhibitors (around 70)
LOADSA hardware
LOADSA software
LOADSA new products
LOADSA games
LOADSA happenings
LOADSA technical advice

...and most important of all for you the visitor —

LOADSA bargains!

With hundreds of special show offers to choose from here's one place you can do your Christmas shopping and end up in pocket.

You can even save £1 a head before you get there by using this advanced ticket form.

If you enjoy computing with Atari you'll be thrilled with the Atari User Show!

SHOW HOURS

FRI–SAT 10am – 6pm
SUN 10am – 4pm

No matter which Atari machine you use from the 8-bit through to the mega ST you'll find just what you are looking for. And even some exciting things you didn't know existed!

For all the leading companies in the Atari market will be out in force to demonstrate their latest developments.

Traditionally the liveliest Atari event of the year, this pre-Christmas show is shaping up to be the most entertaining of them all.

Don't miss it — and make sure YOU enjoy a Merry Christmas!

ADVANCE TICKET ORDER

Post to: Database Exhibitions, Europa House, Adlington Park, Adlington, Macclesfield SK10 4NP

Please Supply:
☐ Adult tickets at £4 (save £1) £.....
☐ Under-16s tickets at £2.50 (save £1) £.....
TOTAL £.....

☐ Cheque enclosed made payable to Database Exhibitions
☐ Please debit my credit card account
☐ Access ☐ Visa

Expiry date: / /

Name .....

Address .....

.....

Signed .....

Admission at door £5 (Adults) £3.50 (Under 16s)
Advance ticket orders must be received strictly November 16, 1988

Phone Orders: Ring Show Hotline 0625 879920
Prestel Orders: Key *169 then 614568383
Micronet/Telecom Gold Orders: Mailbox 72: 614568383

Please quote credit card number and full address.

DATABASE EXHIBITIONS AAUG

How To Get There

Alexandra Palace is so easy to get to by car, rail, underground or bus. It has its own British Rail station, just nine minutes away from King's Cross and there's a free bus service shuttling between the station and show every 10 minutes.

If you're travelling by road, the show is only 15 minutes away from Junction 25 on the M25. Car parking is free.